AMERICAN GAS JOURNAL

OCTOBER, 1938

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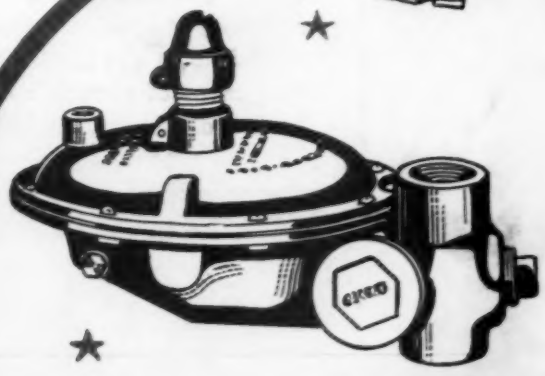

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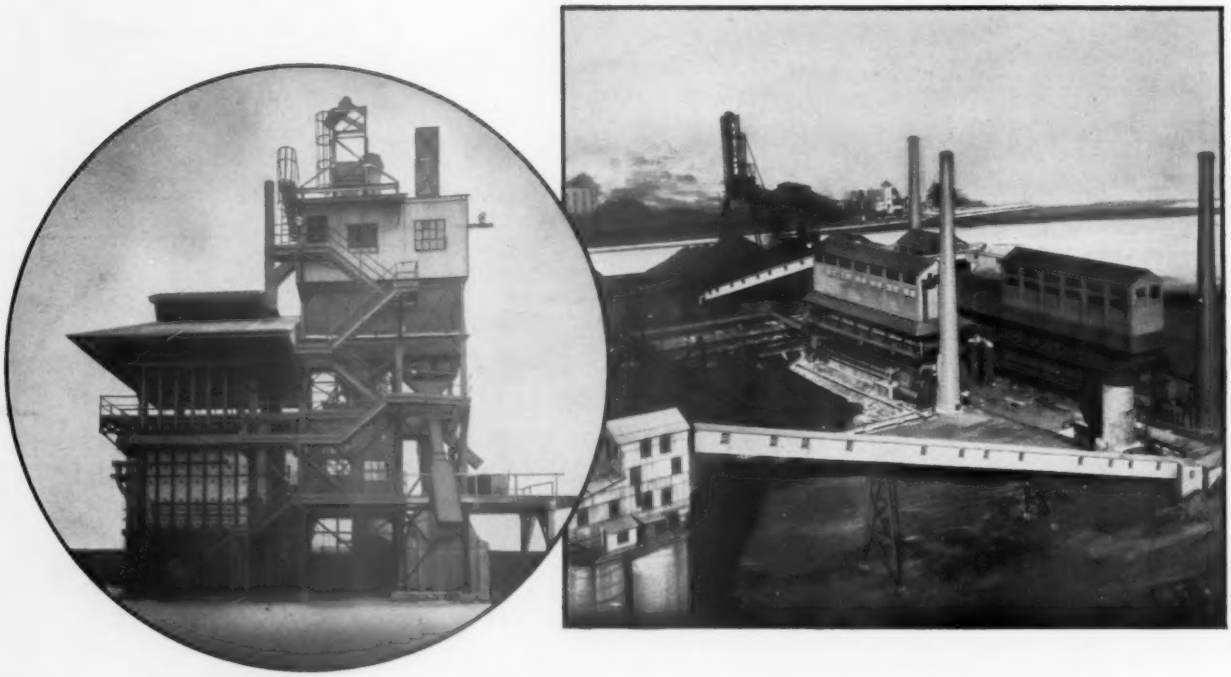

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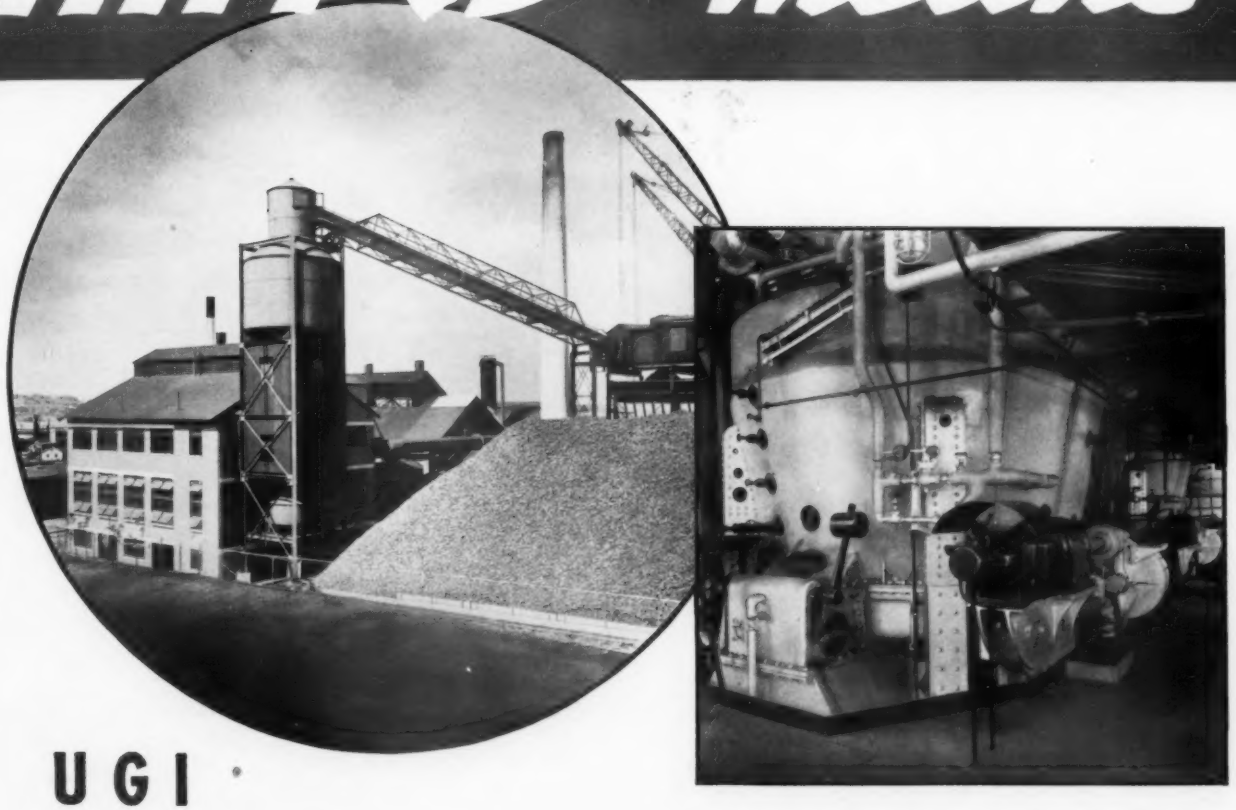

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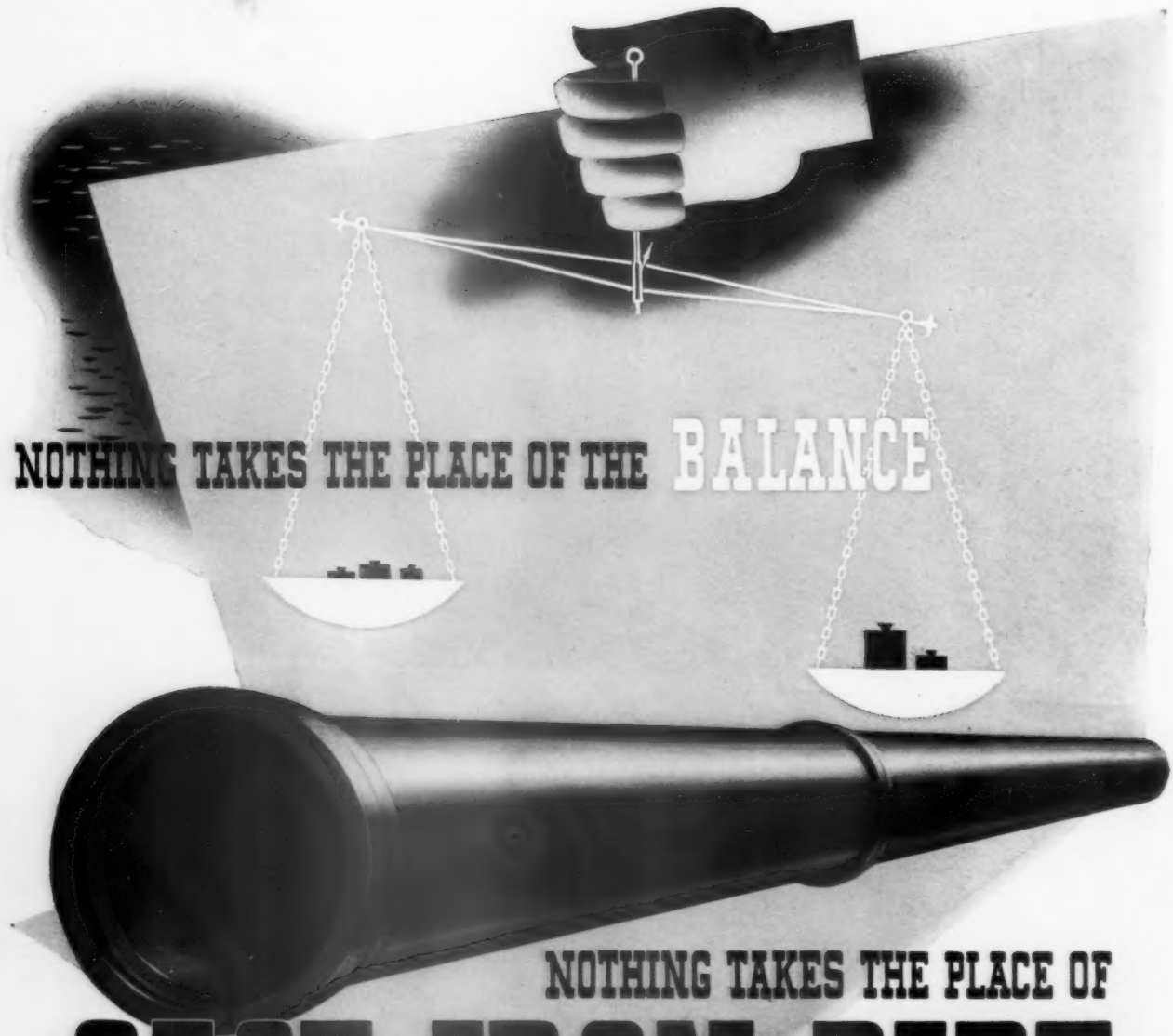

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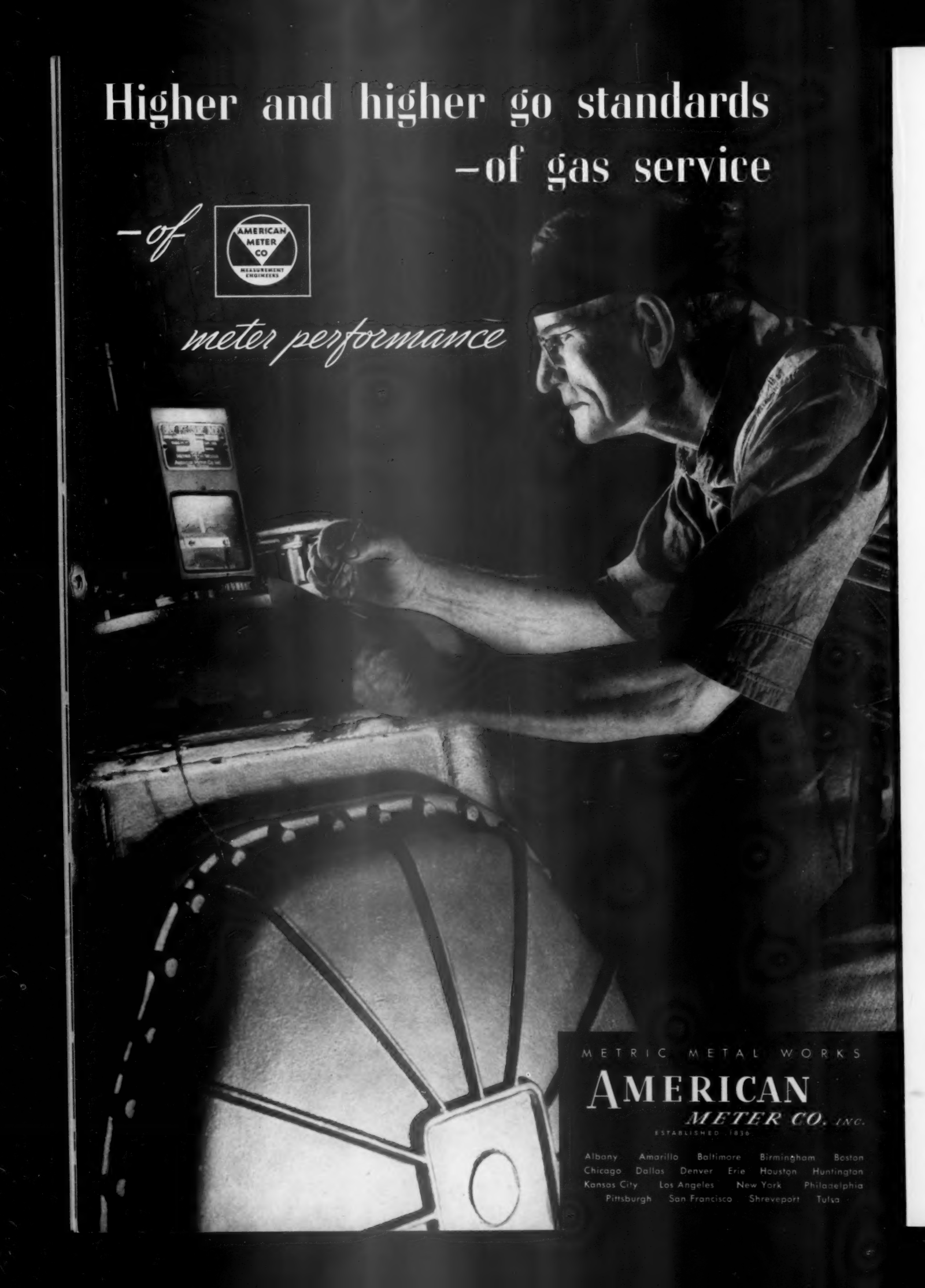
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OCTOBER
1938

AMERICAN
GAS JOURNAL

VOLUME 149
No. 4

New England Gas Companies Maintain Service Through Hurricane and Flood

By
Alfred I. Phillips

ON THE AFTERNOON of September 21st the New England States were visited by the worst hurricane in history. At Westerly, Rhode Island, the wind is said to have attained a velocity of 125 miles per hour, and at Providence and New Bedford 100 miles per hour. Spray from the ocean was carried at least six miles inland.

With the hurricane came a tide of unprecedented height with at least two, and probably three tidal waves, the height of which we cannot estimate. Some say they were 15 feet high; others claim they were several times that figure. We saw photographs which showed the definite, though dim outlines of two enormous waves.

Back in 1868 there was a hurricane which a few old-timers still talk about, but it was mild compared to the historic one of September 23, 1815. Yet in the storm of September 21, 1938, the water reached a height in Providence at least two feet greater than during the one almost exactly 123 years before.

Very nearly coincident with the hurricane, floods occurred along many of the New England rivers. At Hartford, for example, there were twelve inches of rain during the four days preceding the great storm, and the Connecticut River reached the second highest stage in recorded history.

The damage to life and property has been reported thoroughly by the press. But no written words can describe and no photographs that we have seen adequately portray the confusion and destruction. Hundreds of thousands of trees have been destroyed, whole communities have been wiped out and the contour of the shore line has been changed for miles.

Faced with such unprecedented conditions, with plants flooded for periods varying from hours to days, with no electricity for light or power, with telephone communication impaired or non-existent and with highways blocked by falling trees so that transportation was frequently impossible except on foot, the gas companies of New England carried on; and in no instance of which we have record did the gas supply of a company fail. To be sure some districts were without service for a few days, in one or two instances longer, but the overwhelming proportion of the gas consuming public received service with no interruption whatsoever.

The Providence Gas Company faced the most difficult conditions. The office and plant were flooded with salt water to a depth of 5¾ feet or more. At the plant the water was covered with oil which ignited in the boiler house. The coke oven plant was rendered inoperative. A holder was destroyed. Mains in the downtown section were filled with water. But the gas supply did not fail and we understand that about 90 per cent of the domestic customers have had service.

The New Bedford Gas & Edison Light Company, in spite of a flooded plant and compressor station, also maintained service unimpaired to 90 per cent of its gas customers.

The Hartford Gas Company had a different but equally thrilling experience which has been ably described for us by Mr. J. G. Elder, supervisor of sales promotion of the company.

In Newport and Westerly there was no serious difficulty, although the plant in the former place was flooded. Springfield was affected only to the extent that the homes of some customers were submerged. Boston had only about twenty customers whose service was affected. Cambridge had a bent gooseneck on the storage holder and Worcester is said to have suffered damage to some of the building roofs.

So far as we have been able to determine no gas company employee has lost his life, nor has any one of them suffered serious injury, nor has any member of the public been killed or injured by reason of any neglect, oversight or work done by any gas company employee during this period of stress.

One conclusion stands out definitely as a result of the various experiences throughout New England: Water, not wind, was the principal destructive agent insofar as loss of life, damage to buildings and personal property and danger to the continuity of our service were con-

cerned. To be sure the Providence gas holder failed because of wind; but it was an old brick enclosed holder, and the failure of the building roof appears to have been the real cause of the disaster. Apart from that, the blowing down of trees, the roots of which sometimes tore apart mains or services, and the damage to roofs seemed to be the principal items chargeable to the wind.

The vulnerability of electrical equipment where floods are likely to occur was also demonstrated. Steam driven equipment fared better; but the advantages of the gas engine, especially as the motive power for one or more compressors in outside compressor stations, would seem worthy of most serious consideration in view of rather general experience.

As usual, the gas companies have handled a grave emergency in accordance with the best traditions of the industry. As usual the press has had but little comment to make,—it is not much news that the gas is on as usual when all else fails. As usual the public has been mildly appreciative,—electricity and telephone service may fail and water may become unfit to drink but gas is supposed to be there when you want it. As usual gas company officials have had little to say. Perhaps they get most satisfaction from knowing that they had a job to do, in some cases a superhuman job, and that they did it well and were successful.

We take this occasion to thank those who aided us in the collection of this material. We congratulate them on the job they have done. They have reason to be proud of it.

Photo Am-Pro Studios.

Providence Gas Company Office from across the street, 6:45 P. M. September 21st. Flood water stood 5′ 9″ on the sales floor.

PROVIDENCE, R. I.

The conditions faced by the Providence Gas Company during and since the hurricane are probably without precedent in the history of the gas industry. That the gas supply did not fail is little short of a miracle, and is due entirely to the incomparable work of every man connected with the company, and particularly that of Mr. R. L. Fletcher, the vice-president, who was on the job continuously for 75 hours without sleep. Even ten days after the disaster conditions were such that we made no attempt to get a complete story.

At the main office the water stood 5′-9″ on the show room floor during the late afternoon of September 21.

At East Providence a 100 mile per hour wind apparently dislodged the roof of the brick holder house, pushing out one side of the housing and falling on the holder crown. The holder was wrecked and the gas caught fire.

This holder was used to store gas prior to pumping it to Riverside, Barrington, Warren and Bristol. When the holder failed the supply of gas to these places was necessarily discontinued.

By October 1st a new 300,000 cubic foot waterless holder had been ordered and work was under way on the foundation, as shown by the photograph.

At the gas works the entire 40 acres of property was submerged to a depth of about 6 feet. An oil tank apparently let go somewhere in the vicinity, and the salt water was covered with a layer of oil. This took fire in the boiler house. Tanks and separators broke loose. The wind took two coal bridges, and without the wheels turning, slid them to the north end of the track.

The main damage at the plant is to the coke ovens and the electric generating equipment and motors.

Efforts have been made to clean and dry out the electrical apparatus, which is direct current, but it has been found almost impossible to do so. The plant made its own electricity and used direct current motors extensively.

PROVIDENCE GAS COMPANY OFFICE 6:50 A. M. SEPTEMBER 22ND. NOTE OVERTURNED REFRIGERATOR IN SHOW WINDOW.

Photo Am-Pro Studios.

East Providence Gas Holder destroyed by hurricane September 21st.

The coke ovens are of course out of service, being damaged and the auxiliaries without electric power; and the entire load is being handled by the carburetted water gas plant. As of October 1st about 90 per cent of the domestic customers were being supplied, the high pressure lines being out of service on account of the holder failure and the lack of electric power for the plant compressors. The capacity of the water gas plant is limited and the company on October 1st was not supplying gas for house heating nor to most industrial customers.

The entire downtown main system was flooded, and meters and meter connections were torn loose where the buildings were wrecked.

NEW BEDFORD, MASS.

In spite of the hurricane and a tide which put the plant yard under from four to five feet of salt water and submerged much of the machinery, the New Bedford Gas & Edison Light Company gas department continued to render uninterrupted service to about 90 per cent of its customers.

The storm and flood came with but little warning and reached its height just before dark. Electric service was discontinued; telephone service failed, and transportation, except on foot, was made difficult by fallen trees and debris. The wind reached 100 miles per hour. Yet failure of service was confined to (1) outlying areas served under high pressure, (2) houses flooded or destroyed and (3) customers whose services were torn up by the roots of falling trees.

The New Bedford Gas & Edison Light Company manufactures carburetted water gas. There are three 11-foot sets with the usual auxiliaries. One blower and one exhauster are electric motor driven; and one blower and one exhauster are steam driven. The purifiers are elevated and the low pressure holders are all of the water seal type. Steam comes from the electric plant where the boilers are elevated and were not affected by the high water.

New Bedford proper is served under low pressure. The high pressure system runs west to Padanaram and east across the Acushnet River to Fairhaven, Mattapoisett and Marion. There are also three branches in New Bedford feeding into the low

Work on foundation for new East Providence 300,000 cubic foot waterless holder as of October 1st. This will replace holder destroyed by hurricane.

PROVIDENCE GAS COMPANY WORKS YARD ON THE AFTERNOON OF SEPTEMBER 21ST.

Photo by Charles S. Williams, Jr.

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New Bedford, Mass.

Gas plant yard. Tar on building walls shows height of water during storm.

Fairhaven compressor station. The compressors were under water and the compression tanks were floated off their foundations.

Typical scene in one of the shore resorts served by the New Bedford Gas & Edison Light Co.

pressure system through district regulators. At the plant there are two 50-lb. electric driven reciprocating compressors on the ground floor, and three steam driven rotary compressors of low capacity and pressure, mounted on platforms, but with auxiliary condensing equipment on the ground floor. Just across the river in Fairhaven is a recompressing station consisting of five horizontal compression tanks and two electric motor driven compressors.

About 2 P.M. on Wednesday, September 21st, the storm became violent. The wind increased to its maximum velocity during the hour from 5 P.M. to 6 P.M. The tide rose to unprecedented height, flooding both the plant yard and the Fairhaven recompressing station some time after 5 o'clock. Its greatest height is said to have come at 6:05 P.M. when the yard and first floors of the various buildings were under 4 to 5 feet of salt water. Fortunately, the tide went out rapidly; and the yard was flooded only about 3 hours. Tar, washed from the separators to cover everything nearby, including building walls, gives unmistakable evidence of the height the water reached.

With water over the clinker doors of the water gas sets, and with blowers, exhausters, pumps, etc., submerged, gas manufacture was necessarily discontinued some time before 6 o'clock. By 10 P.M. the water had receded, and the steam driven equipment had been put in such shape that gas making could be resumed.

The low pressure distribution system continued to receive gas from the storage holders without interruption.

On the high pressure system all the compressors were rendered inoperative, and the compression tanks at Fairhaven floated off their foundations and broke the gas connections.

When the water rose in the Fairhaven station and put the compressors out of service the distribution foreman, Pat O'Brien, seventy years young, and with a record of fifty years service with the gas company, ran several blocks through the hurricane to one of the district regulator stations and there attempted to save the high pressure supply by throttling the outlet to the low pressure system. But the odds were too great, and the high pressure supply could not be maintained.

After the storm the compression tanks were replaced on their foundations, and the steam driven compressors were put into operation to reenforce the low pressure system. The two principal problems of the gas department then were: (1) Drying out the electric motors and controls, and (2) restoring service on the high pressure system.

In drying out electric motors gas unit heaters played an important part. A motor would first be thoroughly washed to remove any salt. Then a sort of tent would be constructed over it, with a unit heater so arranged as to blow heated air directly on it. The results appear to have been quick and satisfactory. Within ten days practically all of the electric equipment had been put back into service, apparently none the worse for having been under water. The fact that it was built for alternating rather than direct current made the problem easier.

In restoring service in the places served under high pressure, all the meters in a given town would first be turned off. Gas would then be turned in to the mains and the mains purged. A regular turn-on was then made in each house. Service in Padanaram, Fairhaven, Mattapoisett and Marion was restored on Friday, Saturday, Monday and Tuesday respectively. Within ten days the gas department was back to a fairly normal basis of operation.

A few figures may be of interest. The company has about 35,000 customers. About 3,500 of these were without service. The homes of probably 400 to 500 of the latter have been completely destroyed.

Newport, R. I.

Flood waters washed away about 300 tons of coal. Note lobster pot in foreground, washed in from ocean by hurricane.

Oil tank which floated far out across bay and then back to plant yard.

Coke was washed all over yard and about 100 tons were lost.

The cost of the storm to the gas department is estimated at $35,000, principally for additional operating expenses and repairs. This includes the bringing of outside help from Cambridge and Worcester, meals for employees, restoring service, changing and repairing or replacing damaged, submerged or lost meters, repairing mains, services and equipment and cleaning up.

This was an emergency which came without warning, but was met and handled in accordance with the finest traditions of the gas industry. The general public gave thought to the damage and difficulties of nearly all others; but the splendid work of the gas department employees went almost unnoticed because so few people suffered any loss of service and heard nothing of the hard work and intelligent effort that made this possible.

NEWPORT, R. I.

The Newport Gas Light Company plant was flooded to a depth of about 40 inches. As in New Bedford the water receded rather rapidly and there was no interruption in the gas supply.

One 4 inch main washed out and interrupted the service to about a hundred customers until a temporary line could be run to take care of them.

One of the company employees, working to stop the flow of gas from this main said he wished he had a cloth to stuff into the open end temporarily. A boy scout nearby pulled off his shirt, and that was used to plug the main.

At the plant an oil tank broke loose and drifted far out into the bay, but the tide or wind changed and it drifted back onto plant property only a short distance from where it belonged.

Newport has gas street lights. Almost without exception cities in south eastern New England with electric street lights were without service for at least ten days after the hurricane. In Newport, however, the streets were lighted each night as usual.

The loss from the storm and flood is estimated at about $5,000 and consists principally of about 300 tons of coal and 100 tons of coke washed away and about 1,000 feet of 4 inch cast iron pipe which must be replaced.

(Continued on page 20)

How Hartford Met the Storm and Flood

By

J. G. Elder

The Hartford Gas Company

Supervisor of Sales Promotion

The old adage that "Lightning Never Strikes Twice in the Same Place" certainly does not apply to floods. The Great Flood of 1936 was repeated again in September of 1938, with a terrific hurricane thrown in for good measure.

The entire country is well acquainted with the horrible details of these disasters, which wrought such havoc and loss of life in New England. However, with a typical, fine American spirit, "mopping - up" quickly got under way; the various relief organizations did their usual splendid work, and in due time, the awful experiences will be fading memories.

Most events that take place give ample warning to those experienced enough to recognize the symptoms. Shortly after the extremely costly flood of 1936, which caught so many concerns absolutely unprepared, The Hartford Gas Company set up an "Emergency Schedule or Program,"

Hartford during the flood. The Front St. Gas Works appears in the backgrounds and the arrow on the right points to the Gas Company Service Building.

that could be put into effect at a moment's notice. Various officials were given specific details to attend at once, so as to avoid the confusion that usually attends such trouble.

Each department of the company was given instructions to insure continuance of service, even under the most extreme conditions.

Our company has a Water Gas Plant at Front Street, but normally purchases its gas supply from the coke oven plant at New Haven. Water gas is made only in emergencies and to take care of winter peak loads.

Coke oven gas is received at our Madison Avenue Holder Station in West Hartford where we have a 5,000,000 cubic foot waterless holder and a compressor plant.

Hartford and parts of East Hartford are supplied at low pressure. We also supply various places on either side of the Connecticut River at high pressure.

During the four days prior to the hurricane we had a total of 12 inches of rain.

On Monday morning, September 19, the first indication of trouble to come appeared in Manchester, when water reached spring flood levels in Roaring Brook at the Manchester gas holder on Hartford Road. By Tuesday morning, water had reached sufficient height to create an emergency situation. Extra men were pressed into service, and sandbagging around the station was rushed, in order to protect the governor and compressor rooms. Roaring Brook, ordinarily a trickling trout stream, became a raging torrent ¼ mile wide, completely surrounding the holder station. Drip stems were raised, and pumps were operated constantly to keep the water level below the motors and the governor.

By Wednesday morning it was evident that the gas company should swing into the "Emergency Operating Procedure."

The Water Gas Plant at Front Street, which is normally down until November 1, was started and a gas-making machine put under fire to generate water gas in the event there should be trouble on the New Haven high pressure line. A bridge over which this line passes threatened to go out; but it held, and we continued to receive coke oven gas without interruption.

Twelve meter crews were sent into the flood district on both sides of the Connecticut River to remove meters and plug supply lines before the rising waters should reach them. Removal of meters ahead of the rising waters continued all through Thursday, in spite of almost insurmountable difficulties produced by the hurricane, until a total of 1000 meters had been brought in.

About 300 new meters, a dozen ranges, refrigerators, water heaters, necessary fittings, and all automotive equipment and garage supplies were moved from the service building to a vacant lot at Asylum and Cogswell Streets.

The hurricane struck about 2:30 Wednesday afternoon, and increased in intensity, reaching its height about 4:30 P.M. Trees, telephone poles and wires were down all over the entire area, making streets dark and practically impassable.

Falling trees in Glastonbury tore up and broke a six inch main, necessitating a shut-off of the lower part of East Hartford and Glastonbury, involving about 1200 meters. Crews were dispatched to repair the break and shut off meters, but turn-ons could not be started until Sunday noon because of the flood and other breaks.

At our gas works the hurricane damage was confined to some roofs which were blown off.

By four P.M. Wednesday, water had risen on the sides of the waterless holder at Madison Avenue, West Hartford, to a height of 18″, which is 6″ above safe height. There was great danger that the water would get between the holder and the foundation and that the pressure would force the bottom plates upward, causing very serious damage. By means of a fire hose, 5″ of water was run in through drip connections to offset in part the external water pressure and preserve the bottom sheets. This action, taken under the most difficult kind of conditions, undoubtedly was responsible for saving the holder from serious damage.

In the meantime, the entire basement auditorium at the main office, 233 Pearl Street, was completely cleared of all equipment; ranges, both domestic and restaurant type, desks, files, chairs, and the complete Home Service Display and demonstration kitchens, as it was becoming evident that the Connecticut River was well on its way up.

At the plant all electric motors and controls were disconnected and removed to places where there was no danger of damage by flood water.

We have two vertical oil tanks. The oil from one was emptied into the other, just about filling it up. Connections near the bottom of the empty tank were then opened so that water could flow in freely and the tank would not be floated.

By Thursday morning the water had come up into the plant yard. By afternoon, electric power and telephone service were out at both the plant and service building. The plant was shut down. The steam-operated compressor units were under water. We resorted to the new gas-driven compressors which were installed, at a 40 foot elevation, after the 1936 flood. These engines functioned beautifully all through the flood, and kept Northern Connecticut Power and all territory not flooded east of the river, including Manchester and Rockville, in gas service. This was not possible two years ago.

Men working in shifts kept pumping all drips around the holders and yards continuously, thereby keeping lines open. The drip risers had been lengthened and pumping platforms had been erected according to the "Emergency Program."

The Accounting Division was installed in the Hartford Connecticut Trust Company Building where power was available.

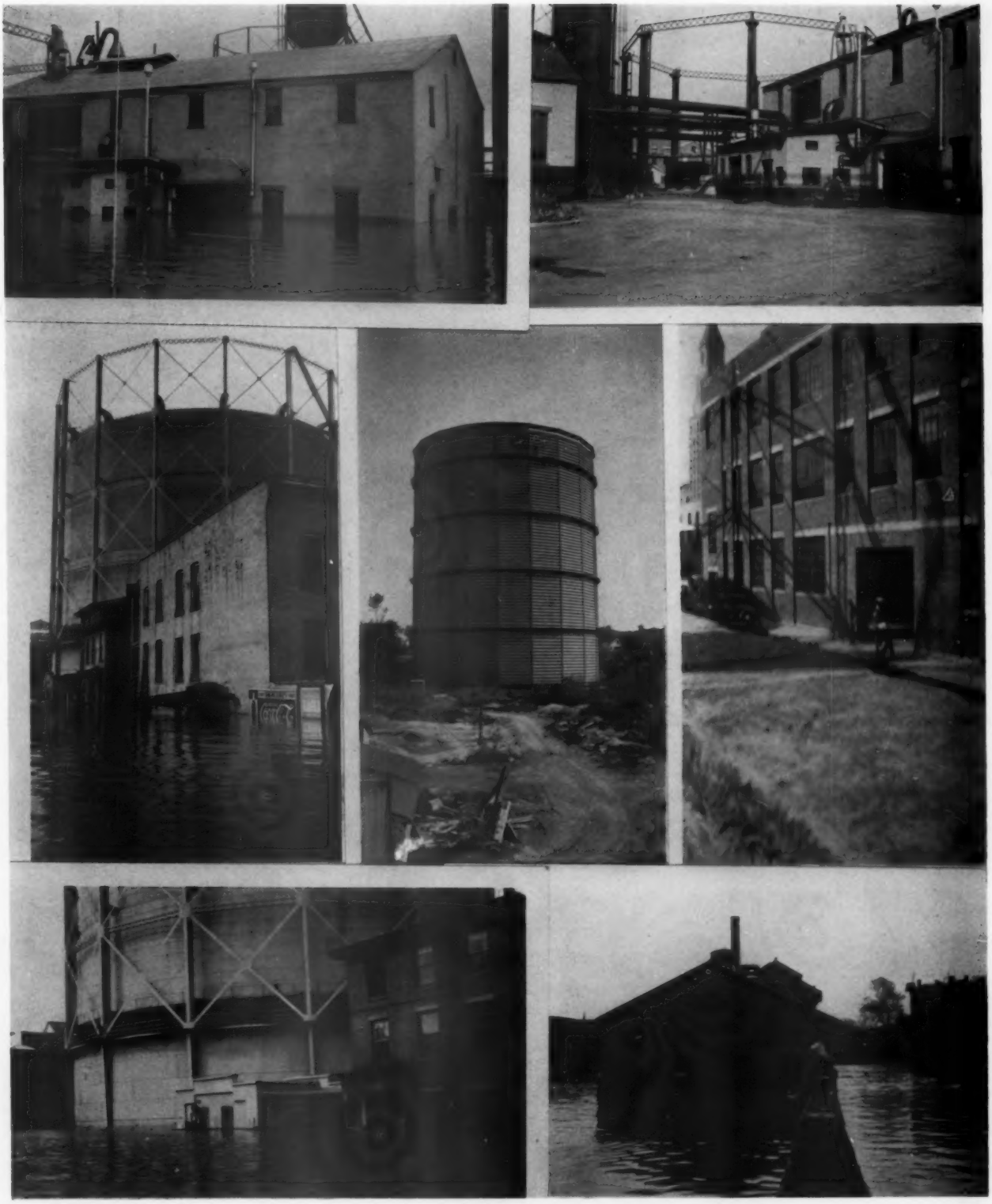
Telephone contact for the plant was established in the Hartford Times Building, and a messenger with boat shuttled between this and the plant, a distance of about a quarter mile.

The basement of our office was filled with water, and at the crest of the flood at 5 P.M. on Friday the water was almost up to the level of our show room floor.

On Sunday the water had receded sufficiently to permit us to start the boilers at the plant.

By Monday night, everything was under complete control and operation was normal. Everyone from the president, Norman B. Bertolette, on down the line was on the job from beginning to end, but schedules had been arranged with the idea of providing time for sufficient rest and sleep for everyone.

One installation which justified itself many times over was a 10 KW electric generator driven by a Lycoming gas engine. This unit was put at our Main Street business office at Manchester a year ago. The Manchester Division office had the only electric lights in the entire city, and during the night of the hurricane and flood were the headquarters for the Red Cross and Chamber of Commerce. Since we had the only open telephone in Manchester to Hartford through our direct line, we offered its facilities to these agencies as well as the State Police and municipal authorities. Radio later became the only means of contact with the outside, and since we had the only electricity, three radios



Hartford, Conn.

Upper left—Water gas generator house during flood. Upper right—Water gas generator house and plant yard four days later. Middle left—Storage holder looking up Arch St. from plant. Center—Madison Avenue Holder which was saved from damage when water rose 18" around it. Middle right—The service building. Water rose almost to the top of the doorway. Lower left—Storage holder and governor house. Lower right—The plant office.

Upper Left—East Hartford where roots of falling trees broke 6-in. high pressure gas line. Note church steeple is missing. Lower left—South east corner of gas plant yard with creek on right. Bridge in background was under water during flood. Sand-bag dyke is beyond bridge. Right—Damage to trees and church in Glastonbury.

were installed and tuned to different stations to receive all reports on New England conditions.

When current from the local light company failed, help was obtained from other local companies. Power for phone service was obtained from the Headquarters Division of the Hartford Fire Department across the street, and emergency lighting wires were run across the building tops to the nearby Telephone Building to give us a limited amount of service.

Even though a flood with a 36.6 foot height followed on the heels of the hurricane with its terrific destruction The Hartford Gas Company lived up to its reputation for dependability and maintained gas service to all but about 1200 of its customers exclusive of those whose homes were under water. When it is realized that this was the second worst flood in the history of the city (only 2.3 feet below that of 1936), and over 19 feet above the so-called flood stage and that this followed the worst hurricane in our history, the splendid work of our employees can be appreciated.

It is felt that the lessons learned from the 1936 flood, and the precautions taken in setting up the "Emergency Program" have saved the company many thousands of dollars, due to removal of meters and motors ahead of the high water and the many other steps taken to permit continuance of service. As it is, the cost to us of the hurricane and flood will probably be about $25,000, additional operating expenses being by far the largest item.

Herculean tasks were performed by many, both in and out of the company. It is impossible to qualify the huge task of the city which so effectively sandbagged the low parts of the Colt Dike. Almost 500,000 bags of sand were placed on a half mile of river front in regular Mississippi River fashion.

Through the entire emergency, the splendid spirit of cooperation from the Telephone Company, the Connecticut Light and Power Company and our own employees was an inspiring experience.

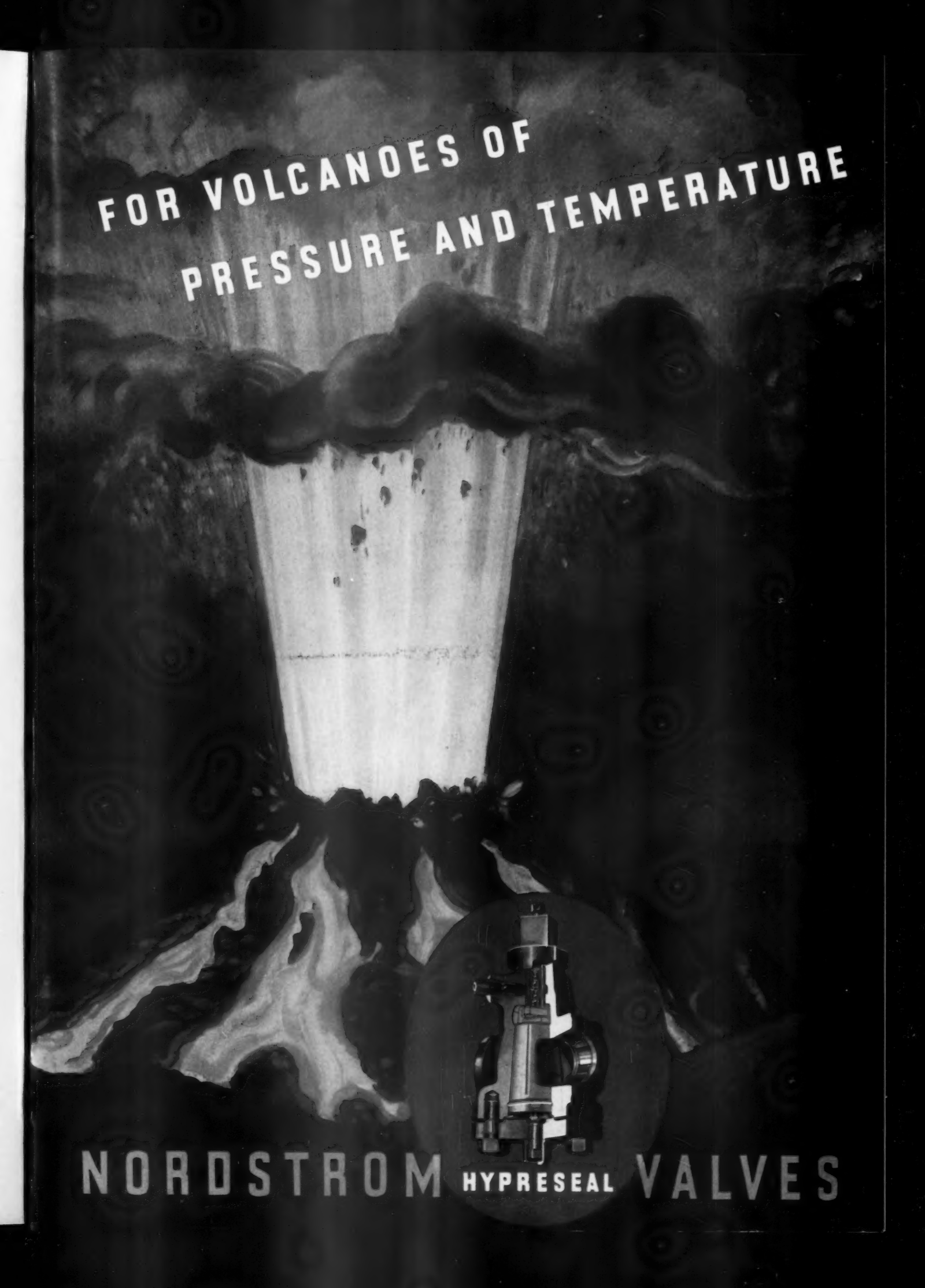
SPRINGFIELD, MASS.

(Continued from page 17)

The Springfield Gas Light Company was not seriously affected by the hurricane; nor did the flood cause nearly the damage or expense that it did in Hartford. The plant is above the high water mark of the recent flood. Approximately 500 customers' homes were flooded and in a few cases mains were damaged by washouts. It is estimated that the total cost to the company of the storm and flood damage will not exceed $3,000.

Gas Supersedes Coal

Two new reel type gas bake ovens have been installed at the Spaulding Bakeries, Binghamton, N. Y. to supplant the coal fired ones. Approximately 16 x 24 ft., each will bake about 720 loaves of bread per hour. The gas demand (850 B.t.u. gas at 3 oz. pressure) per oven is 1500 cu. ft. per hour. The ovens are completely automatic including damper controls, temperature control and safety pilots. These were installed under the supervision of the Industrial Dept. of the Binghamton Gas Works.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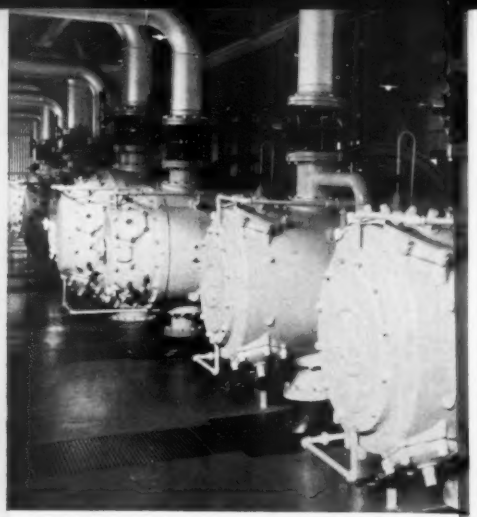
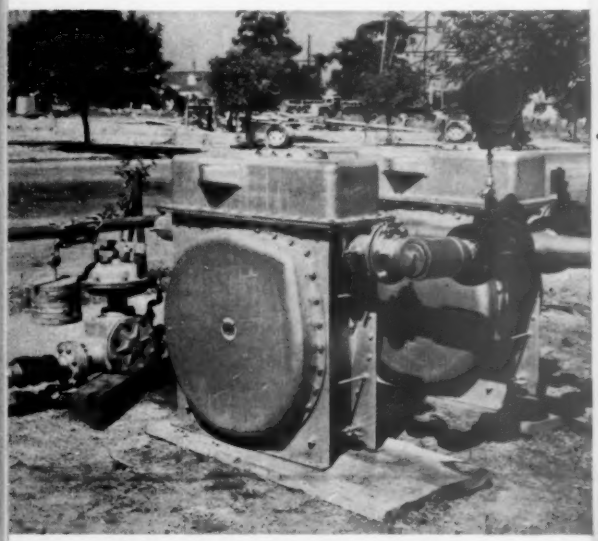
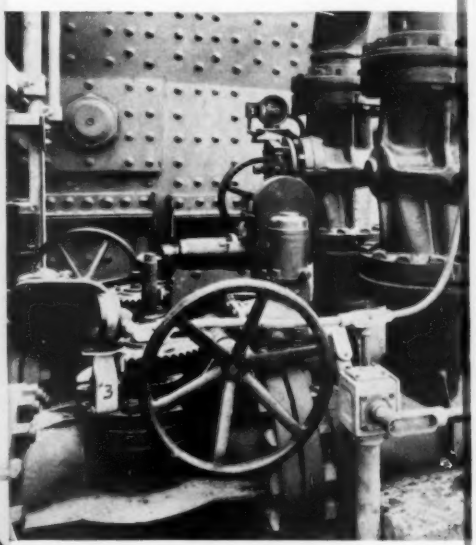


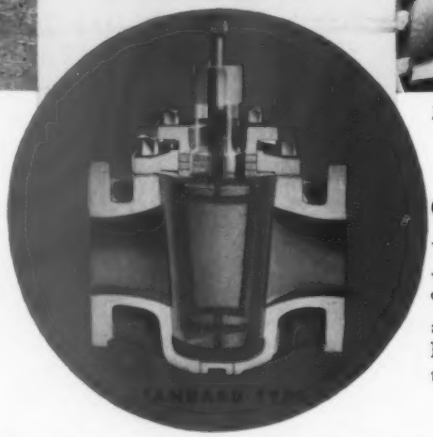
Nordstrom Valves on intake and discharge lines on compressors in an Oklahoma pumping station.



Emco No. 5 Meter, Emco Regulator and Nordstrom Valves on natural gas line.



Nordstrom Valves on gas transmission line equipp with remote control.



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Federal Regulation of Natural Gas Pipe Lines

by
C. Emery Troxel
Wayne University

IT is the "intention of Congress that natural gas shall be sold in interstate commerce for resale for ultimate public consumption . . . at the lowest possible reasonable rate consistent with the maintenance of adequate service in the public interest." This is the goal of the Natural Gas Act which was signed by the President on June 21, 1938, and which gave authority to the Federal Power Commission to regulate the business of interstate but not local transmission of natural gas.[1]

State commissions have had little opportunity to regulate these interstate pipe lines. In three cases involving the Kansas Natural Gas Company the U. S. Supreme Court held that states and state commissions (Oklahoma and Kansas) could not impose restrictions or regulations on interstate transportation of natural gas.[2] But the Court, because it doubtless thought the circumstances different, gave a contrary opinion in the Pennsylvania Gas Company case.[3] Later the Court reversed the Pennsylvania Gas decision and also declared that intrastate commerce in natural gas begins when the gas pressure is sufficiently low to allow the use of gas in customers' burners.[4] Finally, in the Western Distributing[5] and Columbus Gas[6] decisions this Court conceded that state commissions are "entitled to a fair showing" of the cost of gas transported interstate when there is an absence of "arm's length" bargaining. Despite this addition to state control, state commissions had supervision of only a part of the gas moving interstate to public utility uses, nor did they know to what extent they could investigate an interstate pipe-line company's records. Furthermore, separate investigations of a single pipeline company by several state commissions (wherever it would have been permissable) might not have been desirable.

Thus, in recent years a number of attempts have been made to obtain federal regulation of interstate gas pipe-line companies. In 1930 Senator Capper of Kansas introduced a bill—it was never voted upon by the Senate—that provided for a Federal Gas Pipe Line Commission. At that time state commissions objected to the proposed intrusion into state affairs. Next, in the first House draft of the Wheeler-Rayburn bill (which became the now well known Public Utility Act of 1935) provision was made for control by the Federal Trade Commission of interstate transportation of natural gas.[7] Representative Lea of California, on March 6, 1936, introduced a measure —it was essentially the same as Title III of the House Draft of the holding company bill—for such regulation by the Federal Power Commission.[8] Two months later a slightly altered bill was introduced.[9] Neither of these bills was voted upon by the House. Again on January 29, 1937, Representative Lea introduced a similar bill.[10] On March 17, 1937, Senator Brown and Representative Crosser introduced proposals that were alterations of Representative Lea's bill. These were advocated by the Cities Alliance group.[11] On July 1, 1937, the House passed a bill which was about the same as the one offered by Representative Lea, but the "jam" created by the fight on the Court bill prevented consideration of the bill by the Senate in 1937.[12] Finally the Senate passed this measure on June 14, 1938.

This regulatory work is a new and strange task for the Federal Power Commission. The Federal Trade Commission, which was to be the regulatory body under one of the proposed bills,[13] has been dealing generally in its regulatory work with anti-trust and fair-trade cases. In its ten-year investigation of holding companies the Trade Commission studied some of the regulatory problems of the natural-gas industry.[14] Perhaps the Interstate Commerce Commission—seemingly a logical choice—was believed to be too busy with railroad matters to give adequate attention to the gas industry, although the ICC prepared a report in 1936 in which selection of itself as the regulator was recommended.[15] The establishment of a separate commission would have been question-

[1] 75th Cong., 3rd Sess., Public No. 688, c. 556.
[2] *West v. Kansas Natural Gas Co.*, 221 U.S. 229 (1910); *Public Utility Commission v. Landon*, 249 U.S. 236 (1918); *Barrett v. Kansas Natural Gas Co.*, 265 U.S. 298 (1924).
[3] *Pennsylvania Gas Co. v. Public Service Commission of New York*, 252 U.S. 23 (1920).
[4] *East Ohio Gas Co. v. Tax Commission of Ohio*, 283 U.S. 465 (1931).
[5] *Western Distributing Co. v. Public Service Commission of Kansas*, 52 Sup. Ct. Rep. 283 (1932).
[6] *Columbus Gas & Fuel Co. v. Public Utility Commission of Ohio*, 54 Sup. Ct. Rep. 647 (1934).
[7] 74th Cong., 1st Sess., H.R. 5423, Title III.
[8] 74th Cong., 2nd Sess., H.R. 11662.
[9] 74th Cong., 2nd Sess., H.R. 12680.
[10] 75th Cong., 1st Sess., H.R. 4008. See also the bill introduced by Rep. Lea (H.R. 6586) on April 22, 1937.
[11] 75th Cong., 1st Sess., H.R. 5711, S. 1919.
[12] 75th Cong., 1st Sess., H.R. 6586.
[13] 74th Cong., 1st Sess., H.R. 5423, Title III.
[14] See especially *Utility Corporations*, Doc. 92, 70th Cong., 1st Sess., Part 84-A.
[15] "*The Relation of the I.C.C. to the Regulation of the Transportation and Sale of Natural Gas.* . .," File No. 86-C-2, June, 1936.

able unless the regulatory work with gas pipe lines is to be heavier than now appears likely. However this may be, the Federal Power Commission was selected as the regulating body.

There is the usual jargon in the Act about maintaining just and reasonable rates. Also the Act forbids "undue prejudice," i.e., "unreasonable difference in rates, charges, and service." Considerable information may be assembled on the variation in natural gas rates, especially the difference in, say, domestic and industrial rates. Those, who most assiduously worked for passage of this Act, believe that this rate situation alone was sufficient justification for the law.

Granting that these rate differences exist and that they may be circumstantial evidence of discrimination, there is no sure way of determining what is and what is not an unjustly discriminatory rate. The principal costs of transporting gas 500 to 1000 miles are depreciation of and return on the investment in such lines. These heavy fixed costs have been incurred to transport gas for domestic as well as industrial customers. And, thus, we encounter the impossible task—so common among utility industries—of determining precisely the cost of a particular class of service.

Furthermore, some pricing based on value of service rather than cost of service may be necessary if such pipe lines are to be built and if, after they have been constructed, they are to earn a fair return. Like railroads, some of these new long-distance lines—at least in their infancy—are obliged to put different prices on gas sold for various classes of service to avoid deficits. The cost of building a high-pressure, long-distance line does not increase proportionately with its capacity. Domestic customers alone could not or would not be willing to pay a price for gas which could assure a fair return. Consequently, there is a reasonable explanation for the low prices for gas sold to industries, a situation that is analogous, for example, to the low freight rates on coal. Probably it will be necessary for these low industrial rates to be continued for many years. At least the long-distance lines are not yet notably profitable.

The writer believes that different rates for several classes of public uitlity service represents a monopoly practice that regulation has not eliminated.[16] A change in this practice probably would involve calculation of the cost of supplying the several classes of service. But there is no single answer to such a joint-cost accounting problem. The Federal Power Commission, therefore, may be stopped in arriving at a fair solution. Or, if it is irrational and if it seeks blindly the now common governmental goal of lower utility rates, it may make crude and probably insupportable guesses on the "proper" variation in rate schedules.

All rates, contracts, and "practices" for transportation and sale of gas will be available for public inspection. No change may be made by a company in a rate, contract, classification, rule, or service except after thirty days notice to the Commission and the public unless the Commission waives this requirement. Such proposed changes may be suspended for five months upon the complaint of a state, city, state commission, or the Commission's own initiative. If a decision has not been made at the end of 5 months, the proposed increase is made subject to refunding where the ultimate decision does not support the increase. Precedence will be given by the Commission to investigations of requested increases of rates. It is interesting to note, moreover, that the Commission has no authority "to suspend the rate, charge, classification, or service for the sale of natural gas for resale for industrial use only."

There is nothing peculiar about the provisions respecting valuation of a gas company's property. The Commission is empowered to investigate the "actual legitimate cost" of property, depreciation, and "other facts" bearing on fair value. Although *actual legitimate* cost is the only basis of valuation singled out, it cannot be said that the Federal Power Commission has been ordered to give most attention to original cost. It merely indicates that original cost—or probably prudent investment when the word *legitimate* is noted—was favored.

Pipe-line companies may be required to file inventories of all or part of their property and to include statements of original cost of the inventories. In order that the inventory may be maintained, similar information may be requested on additions, betterments, extensions, and new construction. A continuing or perpetual inventory is a useful, though sometimes costly, means of facilitating rate investigations. With these inventories, reproduction-cost and original-cost valuations of "used and useful" property can be more quickly and accurately determined. There should be fewer controversies about padded inventories; and, perhaps, there would be less disparity among engineers' reproduction-cost studies. This section may be developed, therefore, into perpetual inventories similar to those required in connection with new system of accounts (since 1933) of the Federal Communications Commission for telephone companies.

In addition to its power to require periodic and special reports in whatever form they are desired, the Commission, of course, will be able to prescribe a system of accounts. Because records of cost-accounting procedures may be ordered, it is possible that the Commission will attempt in this manner to find a means of allocating costs to the several classes of natural-gas service. But it has already been said that this procedure may not obtain results permitting unquestioned determination of cost of and rates for these types of service. Perhaps, too, the system of accounts will specify an original-cost valuation and adjustments on book value of assets, a clearing account for affiliated-company transactions, and a separate capital-stock expense account as do the recently revised systems of public-utility accounts.[17]

"Proper and adequate" depreciation and amortization rates and accounts may be required for property "used and useful" in the production, transportation, and sale of natural gas. Possibly, as previously noted, some of this depreciation information will be assembled in connection with property inventories. But there is nothing in the Act—nor was it expected—that will remedy the prevailing trouble about accrued (or observed) depreciation, a valuation job which the Supreme Court has believed to be best done by engineers' appraisals. There will be, however, some gain from making depreciation allowances more nearly uniform since there is evidence that pipe-line companies have made widely divergent allowances.

The adequacy of a company's gas reserve including leases and royalty contracts may be determined by the Commission. There is, obviously, no accurate means of measuring the extent of the gas supply in undeveloped land. The Commission may restrict its judgment, therefore, to developed or operated land. If a company's reserve were declared inadequate there is, furthermore, no announced means whereby the Commission could force the company to acquire additional reserve. That the Commission might permit another company to sell gas in the company's

[16] Emery Troxel, "Class Prices for Gas and Electricity," *American Economic Review*, June, 1938, pp. 275-90.

"territory" (the provisions on extension of facilities will be discussed soon), is a possible means of forcing a company to increase its reserve.

It is within the powers of the Commission to judge the extent to which delay rentals for unoperated land and leases may be included with operating expenses, i.e., what are the expenses on an "adequate" reserve. A number of cases may develop upon this question, since several systems control over 1,000,000 acres of operated and unoperated land and because customers may concur with the Supreme Court which has said that "at times the immediate purpose of buying up extensive tracts is to forestall or stifle competition. . . ."[18] On the contrary, where public-utility and independent producers have leases in the same pool, the independent may force the utility to purchase his leases and wells for their "nuisance" value when development of the pool is started, before the utility company has use for the gas. If the land is operated (the word is subject to an arbitrary definition) possibly there would be no question about allowable delay rentals even though there might be one well on a leased plot of, say, 5,000 acres. Because treatment of delay rentals only is mentioned, it may be guessed that the expenses on land owned in fee would not be subject to elimination from operating expenses. Moreover, no particular attention was given in the Act—doubtless a wise choice of its framers—to valuation of developed and undeveloped land and leases. Nor was there any comment upon treatment of depletion allowances unless the amortization provisions are applicable. Yet these have been the principal issues of many cases.[19]

There is one short section treating financial practices. An officer or director of a natural-gas company cannot "receive for his own benefit, directly or indirectly, any money or thing of value in respect to the negotiation, hypothecation, or sale" of any security issued by his company. Nor may he participate except for liquidating purposes in declaration or payment of dividends from funds "properly" included in the capital account. This may seem to be too scant attention for financial matters—earlier bills had more finance requirements[20] but it may be observed that regulation by the SEC under the Securities Acts and the holding company bill substantially fills this void.

A natural-gas company can be required to make some service extensions to persons or cities; to obtain permission of the commission for abandonments; and to obtain a certificate of convenience and necessity before pipe-line facilities may be constructed to a new market. A company may be ordered "to extend or improve its transportation facilities . . . and sell natural gas to any person or municipality engaged . . . in the local distribution of . . . gas to the public." Thus, a pipe-line company may be obliged to furnish gas to communities "adjacent" to its line or in its "territory" when the "Commission finds that no undue burden will be placed" on the company. But such orders may not be given wherever they would impair the company's ability to give "adequate" service to its existing customers. Again the Commission has discretionary power for there is no exact meaning of the significant terms *adjacent, territory,* and *adequate* service. Though the Interstate Commerce Commission has had a similar power since 1920, in the only instance in which it ordered the construction of a railroad line (200 miles) the Supreme Court held that

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[17] Cf. the writer's, "Improvements of Public Utility Accounting," *Journal of Business,* v. 11, Jan., 1938, pp. 1-20.

[18] *Columbus Gas & Fuel Co. v. Public Utility Commission of Ohio,* 292 U.S. 398 (1934).

[19] The writer has stated elsewhere his conclusion on these matters: "Some Problems in State Regulation of Natural Gas Utilities," *Journal of Land & Public Utility Economics,* May, 1937, pp. 188-203.

[20] 74th Cong., 1st Sess., H.R. 5423, Title III; 74th Cong., 2d Sess., H.R. 11662.

[21] *Interstate Commerce Commission v. Oregon-Washington Railroad & Navigation Co.,* 288 U.S. 14 (1933).

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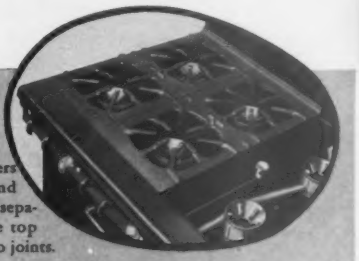
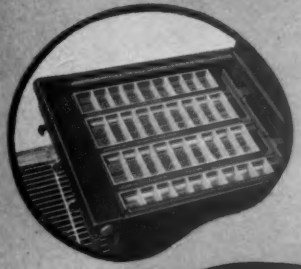
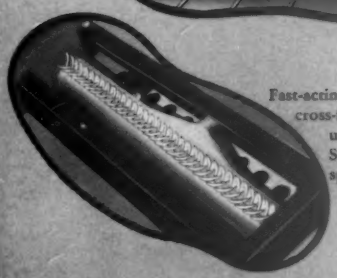


190 Series Cooking Top, showing HiLo Control round non-clog burners with grates and lighter. Note separate one piece top front cover—no joints.



Top view of 620 Broiler showing radiants and grid.

190 Series Oven—26″ width takes two 12½″ roasting pans side by side.



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Gas-Designed Steam Boilers

by
Raymond F. Mann
Wentz-Mann Company
Kenmore, N. Y.

THE title of industrial gas engineer presupposes a certain knowledge of gas-designed steam boilers and their application. The engineer should be familiar with the various types of boilers on the market, their control mechanism, their relative merits, and the proper application of each type. He should be acquainted with the local boiler ordinances; and finally he should have technical knowledge covering the steam requirements of standard industrial usages, the amount of steam coil needed for heating a certain amount of solution in a definite time, the cost of steam generation with competing fuels, and other similar data. The American Gas Association Industrial Section Booklet "Steam Boilers" gives much of this information and should be in his reference library. It is the purpose of this article to discuss in some detail the different types of boilers and the advantages and disadvantages associated with their various designs, with the hope that it will aid the engineer in recommending the best type for a particular job.

Several subdivisions can be made of the various types of gas-designed steam boilers available. Perhaps the most fundamental division is into the two classifications of cast iron and steel boilers, so we shall start from that point.

Cast Iron Versus Steel Boilers

A basic difference between the two is the fact that the cast iron boiler is used solely for low pressure steam generation, running to a maximum of 15 pounds per square inch. More usually the pressure lies between 2 and 5 pounds. While this is the field of the conventional house-heating boiler (cast iron being used almost exclusively) there are many commercial and industrial usages embraced in this range.

The cast iron boilers are distinguished by their sectional design, one of their main advantages. They are shipped in sections, carried thus to the proper location, and assembled there, usually by means of push nipples and tie rods. The individual sections are small enough to enter any ordinary door and be carried up or down any ordinary stairs. Besides this advantage in handling and erection, the sectional design permits replacement of a section that fails without necessarily condemning the entire boiler.

The resistance of cast iron to corrosion is greater than that of steel and any sulphurous acid from the condensation of flue gases will do less damage. In producing the casting, fins or baffles can be cast integral and high efficiency built into the casting. The greater mass holds more heat and causes less rapid fluctuation in pressure as the burners turn on and off. These are all advantages claimed for the cast iron boiler.

Typical Cast Iron Boiler.

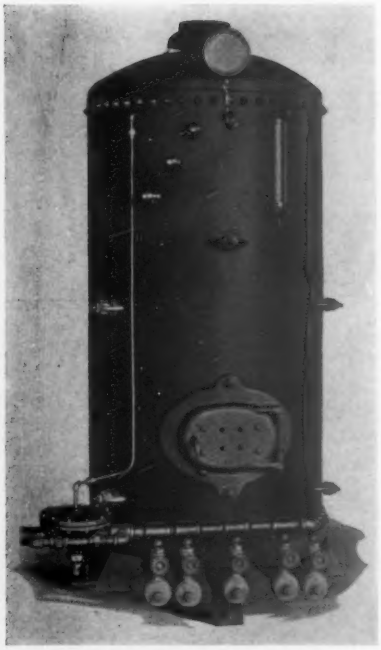
As against the above advantages are certain positive disadvantages. The greatest, perhaps, is the inaccessibility of the water side of the heating surface. If the system is closed, i.e. all the condensate returns to the boiler, as in the househeating field, this is not a serious objection. If, however, a goodly share does not return, say because live steam is needed as is the case in bakery work or heating pickling tanks, and fresh water must constantly be added, this is a most serious disadvantage. All water from ordinary sources contains dissolved solids and usually carries a small amount of entrained insoluble matter. On boiling away the water this solid matter is precipitated and falls to the bottom. Heat applied at this point causes this material to form a hard scale which not only acts as an insulator and reduces heating efficiency; but frequently due to the uneven heating, it causes a section to crack. Frequent blowing down of the boiler is not a sure preventative of this condition; and means should be available, as is the case with steel boilers, to get to this scale and pry it loose. Thus the use of a cast iron boiler for the generation of live steam should be questioned.

The gas-designed steel boiler was once considered as built solely for high pressure steam work, but more and more do steel boilers invade the low pressure field in direct competition with the cast iron boiler. A.S.M.E. requirements call for riveted construction for pressures exceeding 15 pounds, but below this figure welded construction is customary.

The steel boiler is made of a material of far greater tensile strength and resiliency than cast iron. Not only can it withstand greater pressure but on alternate heating and cooling the expansion and contraction strains set up are easily resisted. There is no cracking of sections. The usual design permits faster steaming. Weight and space requirements are reduced. A fire tube boiler can be rerolled or retubed locally if it fails. Thus the case for steel boilers.

Fire Tube, Water Tube, and Tubeless Boilers

Concerning ourselves solely with the steel boilers from this point on, we find a natural subdivision into fire tube, water tube, and tubeless types. As the names indicate, in the first two either the hot products of combustion ("the fire") or the water flows through a series of tubes or coils surrounded by the other ele-



Typical Vertical Fire Tube Boiler with Water Leg Construction and Throttling Control.

ment. The fire tube boiler uses straight, so-called "boiler tubes" of sizes to be discussed later. The water tube type uses coils quite tightly wound to obtain a large amount of heating surface in a jacket of conventional size. The tubeless is merely a drum around which the hot gases pass, employing some kind of extended heating surface to act both as a baffle and as a heat absorber.

The greatest advantage claimed for the water tube make is speed in steaming. The smaller volume of water they hold gives this extra speed, although it is doubtful if such boilers are much faster than the immersion type of fire tube boilers. A claim of higher operating efficiency is likewise rather questionable, especially in view of their main disadvantage. Their greatest liability is the same one that plagues the cast iron boiler, i.e. inaccesibility of the water side of the heating surface. Lime and mud from fresh water build up in the small passes through the coils and form scale, lowering heat transfer and ultimately leading to burning out. I have known a boiler of this type used here in Buffalo on lake water of 9.8 grains per gallon hardness, to burn out its coils in just under a year. Even admitting failure to blow down the boiler daily as the manufacturer recommended, such a life is limited and new coils are costly.

The tubeless boiler manufacturer offers freedom from burned out coils or tubes and hence a lower maintenance cost. When his boiler fails, it fails all over. The large mass of water that must be heated from the outside in tends towards slower steaming and response, and hence a more sluggish action. Heat is applied from the outside, except in the waterleg type, and a heavily insulated jacket must be employed to keep the heat in and obtain good efficiency. Whether the absence of replaceable tubes or coils is an advantage or disadvantage we'll leave to the salesmen. A strong case can be made either way.

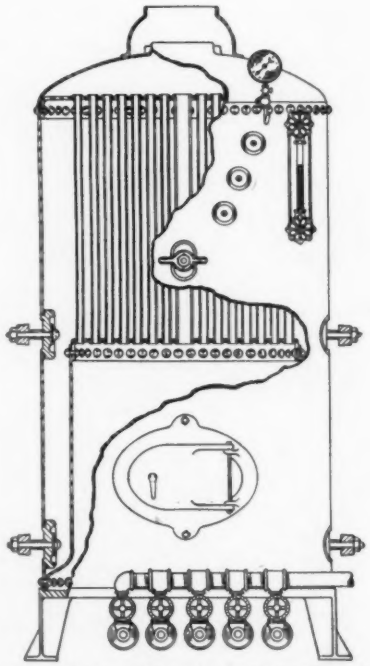
The fire tube type is by far the most common in the industrial world and hence it may be well at this point to study it in some of its more or less minor variations.

Fire tube boiler design

Considering first the vertical type, a number of manufacturers are represented such as the Eclipse Fuel Engineering Company with several designs of McKee boilers, P. M. Lattner Manufacturing Co., Mears-Kane-Ofeldt Company with the Kane line, and the Sellers Engineering Company. These boilers differ one from the other in such matters as furnishing an insulated jacket as an integral part of the boiler, allowing part of the hot products of combustion to pass up between jacket and shell, or keeping all the flue gases within the tubes, shipping without a jacket, and recommending insulation applied on the job after the boiler is set up directly to the shell.

The advocates of the former point to the added surface available for heat transfer if the shell exterior is used. The advocates of the latter say that the hot gases are bounded on the other side by the jacket; and at that temperature the radiation loss is high, even with good insulation of the jacket, thus counterbalancing the effect of increased heating surface. There is merit in both claims. The industrial engineer should make sure, however, that just because one type is shipped without including insulation, it is not left that way. For any real efficiency, insulation is necessary; and its application will reduce gas consumption materially.

A difference also occurs in tube size. The conventional gas-designed steam boiler uses 1″ or 1¼″ boiler tubes as compared to the usual 2″ of a coal-designed boiler. The advantage of these smaller tubes in preventing the so-called "channeling" of the hot flue gases has been explained in another connection (see article in April 1938 issue of the *Journal* on "Immersion Burners"). Naturally with coal, such small tubes are out of the question due to the danger of clogging with ash and soot and also because of the necessity of a good draft. The following comparison between two typical 10 horsepower boilers is interesting. Both are standard makes of high pressure, vertical fire tube boilers, one gas-designed and one coal-designed:—



This Shows Internal Construction of Boiler. Note Cold Water Leg.

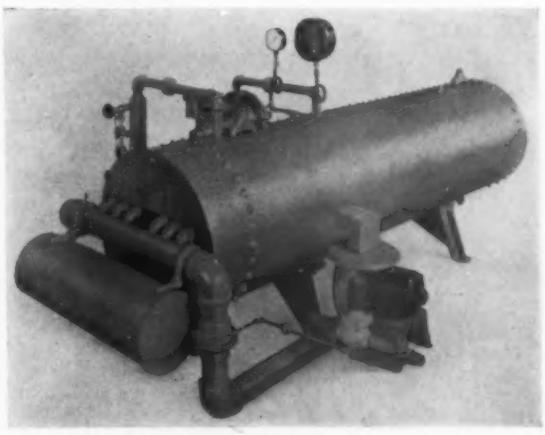
	Gas Boiler	*Coal Boiler*
Number and size tubes	160-1″	48-2″
Length of tubes	33″	48″
Tube cross sectional area	91.2 sq. inches	122.5 sq. in.
Tube internal area	98.8 sq. feet	91.0 sq. feet
Heat transfer	3,390 Btu/sq. ft.	3,680 Btu/sq. ft.

One maker of vertical gas-fired boilers uses standard 2″ tubes, but places patented baffles or "core-busters" in the tubes so as to set up a turbulent flow in the flue gases, thus breaking up the "dead air film" common to tubes this size. This method has been successful in getting high efficiencies, and has the advantage of permitting local boiler retubing if necessary at any time.

Another important distinction or division of fire-tube boilers is between the "water-leg" and "tub"

types. In the "tub" type the boiler shell is cylindrical in shape with a flat bottom or crown sheet. The burners are located directly below the shell, which is supported by some kind of metal ring, steel or casting. Mud or lime falls on to the lower crown sheet directly above the burners and is baked on to form a hard scale, difficult to remove, increasing gas consumption, and eventually causing boiler failure. Hence such a boiler is best for closed systems or very soft water and is rarely manufactured in the larger sizes.

The water-leg type, on the other hand, has a water-leg or mud drum that surrounds the combustion chamber, extending down below the burners. Thus the lower part of this chamber is relatively cool. Circulation in the boiler is upwards around the tubes and downwards along the cooler outer shell, thus allowing the mud and lime to fall out at the sides and settle down into the water-leg. Due to the mildness of temperature there this sediment remains in a "mushy" condition and can easily be blown out. Hence less trouble with hard water and a longer life than the "tub" type.



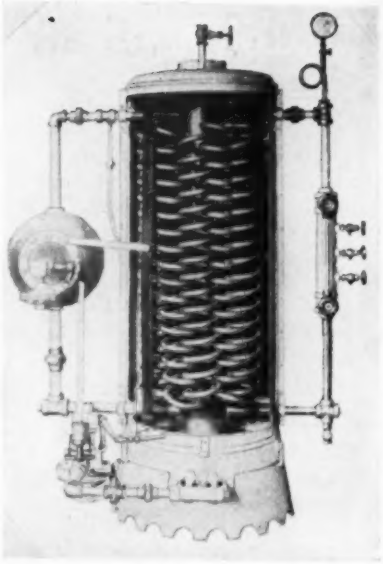
Horizontal Immersion-Fired Boiler.

An important departure in the design of fire-tube boilers of recent years has been the horizontal immersion fired type. This principle has been used in England a number of years, but is comparatively recent in this country. Combining immersion firing with horizontal tubes offers many advantages. In the first place, the immersion system of gas combustion is admittedly higher in efficiency than the conventional method of burning the gas in a chamber external to the boiler shell. A fire travel of 12 to 14 feet is used as against 2 to 5 feet for the vertical type. As the tubes are located near the water surface very fast steaming results. Mud and lime drop to the bottom below any tubes in a comparatively cool reservoir, where it remains soft and mushy and is easily blown out. The tubes being completely submerged are not subject to corrosion at the water line, a frequent cause of failure with vertical tubes. One of the biggest advantages is the low water line that is possible with this type. In the ten horsepower size, for example, the water line is but 18" from the floor. This permits direct return of condensate to the boiler from most steam heated equipment without resort to pumps or locating the boiler in a pit or on a lower floor level.

The disadvantages of the horizontal boiler are two. First, the demand for more floor space than the vertical. This is balanced by the fact that it demands less headroom and can be mounted on the wall or hung from the ceiling so as to require no floor space at all. Second, the fact that it incorporates an electric blower and hence is dependent on electricity being available. Since, however, the motors are of standard make and but fractional horsepower, this is not a serious objection and is balanced by the fact that the control problem is much simplified and permits an "all-on, all-off" operation, the advantages of which will be discussed below. Decidedly the horizontal boiler is destined to be an important factor in the gas boiler field.

Control Mechanisms

A final classification of gas-designed boilers can be made from the standpoint of their control systems, the main divisions being into the "throttling" and the "all-on, all-off" types. Until quite recently the throttling control was almost universally used. In this type a small tube leading from the steam chamber of the boiler carried the steam pressure to the top of a spring actuated diaphragm valve in the gas line. Normally the spring held the valve open, but as steam pressure built up it would gradually close the valve by its pressure on the diaphragm. Adjustment of the spring tension controlled the point at which the boiler pressure could close the valve. The action was gradual, the flame being "throttled", and to some extent the valve would "float", adjusting the gas flow to just balance the demand for steam. Such a result was, of course, highly efficient, and gave a boiler that was truly automatic. Unfortunately such a condition was only possible where the load did not fluctuate widely and remained at a point representing a major fraction of the boiler capacity. The reason for this statement is that, due to the use of atmospheric type gas burners, the actual turndown available without the burners flashing back into their mixers is limited. When the steam pressure closes the diaphragm valve in the gas line, provision must be made to keep a flow of gas to the burners, and this is accomplished by means of a by-pass either incorporated in or constructed around the diaphragm valve. This by-pass has to be set high enough to keep the burners lighted under all conditions and this generally means allowing a flow of from one-quarter to one-third of the total gas capacity of the burner at all times. Admittedly this is a limited turndown for an atmospheric burner, but in a boiler of conventional design the flame has to be sharp (a high air-gas ratio); and with the stack effect that is set up, the frequency with which the control operates, and the dependence placed by the average user on the automatic operation of his boiler as evidenced



Water Tube High Pressure Gas Boiler.

by the little attention he gives it during working hours, it is necessary to be well on the safe side.

This all means that when the boiler with a throttling control is used for widely fluctuating loads or has fairly long periods of little or no demand, trouble is apt to be in store. If the boiler is not insulated or a poor job has been done, and there is much exposed steam piping, this bypass flame may mean but a slow increase in steam pressure during the periods of low demand. On the other hand, it may mean the popping off of the steam safety valve. In either case, gas has been wasted and the efficiency of gas utilization has suffered materially. I have seen two striking examples of this trouble. In one case an 8 horsepower boiler with throttling control was installed in a plant manufacturing rubber composition matrixes in hydraulic steam heated presses. The boiler was purchased in the expectation that four machines would be connected to it. Only two, however, were connected, and generally only one was in use. Regularly the safety valve would "pop". If only one of the four burners was turned on, the time of raising steam became so long as to create trouble. With all four the minute the load dropped the steam pressure climbed to 100 pounds, the safety valve setting, and blew off. A very fine job of insulating boiler and lines had been done, and the constant radiation loss was negligibly small. Eventually the throttling control had to be replaced by the all-on, all-off type which eliminated the trouble. In another case, a 25 horsepower boiler was installed in a large bakery. As long as steam was needed by the ovens everything was fine; but after the ovens were through for the day, a small amount of steam was still needed in a sink and in a hose connection for washing up. Again the demand was too small for the boiler bypass and the safety valve would pop.

Thus the need for and present day availability of the "all-on, all-off" types of control. This generally is achieved through the replacement of the diaphragm valve by an electric solenoid or motor valve, operated by a pressuretrol on the boiler, and supplemented by a constant pilot burner with thermostatic safety control. The pressuretrol is of the mercury tube type with an easily adjusted pressure setting and an adjustable differential. This is a distinct advantage over the diaphragm type in that one can quickly and accurately set the boiler pressure at a desired point and even control the turning-on and turning-off positions. The diaphragm valve is adjusted by tightening or loosening the tension of the spring, an action that is neither exact nor readily performed. The constant burning pilot consumes a negligible amount of gas, and generally acts to light another burner which in turn ignites the main burners. A safety valve is made part of the constant burning pilot, and should it be extinguished for any reason prevents turning on of the main burners.

Naturally the "all-on, all-off" control is somewhat more expensive both in cost of the equipment and its installation on the job. Electric failure shuts down the boiler, although it can be operated even then by hand if necessary. Its use, however, must be recommended under such conditions as described above where the throttling type leads to operating difficulties.

Advantages of the Gas-Fired Boiler

Having discussed the various types of gas designed boilers, it might be profitable to devote a little space to their advantages as compared to competitive boilers.

These advantages will vary with the purpose for which the boiler is to be used. Thus cleanliness, an exclusive gas feature, would be of major importance to a bakery or a dairy but mean little to a tire retreader. Exact pressure control, meaning accurate temperature regulation, might be essential to a manufacturer of preserves, but leave the owner of a plating works cold. A clothing manufacturer in a fifth story loft couldn't get along without the convenience of a fuel that is piped to a boiler that can be located alongside his pressing machines. The compactness of the gas boiler with the elimination of a coal storage space will interest some. Doing away with any labor for firing, maintaining steam pressures, carrying out ashes appeals to many. The talking points are many, just fit them to the particular job.

Perhaps one of the most common objections advanced is this:—"Yes, your arguments are good but I have a large boiler that I must run to heat my plant during the Winter. The added load for process steam means little." Obviously your answer is:—"That may be so in Winter, but what about the Summer months. A large boiler operated at low rating is extremely inefficient. The most practical method of operating is to install a gas boiler for the process load and shut down the large boiler completely during the Summer." Further investigation may show that only the office part of the plant needs any heat until nearly freezing weather and the ultimate result may be the sale of gas-fired equipment for heating the office in Spring and Fall. Thus one sale leads to another and like the camel of the fable we will eventually inherit the entire tent. But as in any selling work it is necessary to know your subject and in selling boilers a knowledge of the types available on the market will help in meeting your consumers' needs in the most practical and efficient way.

Summer Sales Success

The Gas Service Company of Kansas City reports that during the months of July and August the new business departments were campaigning on all types of heating appliances. The salesmen were able to offer a special discount of 10 per cent on heating appliances purchased during the month of July and a special discount of 7½ per cent on heating equipment purchased during the month of August.

The month of August found the new business departments successful in adding a large amount of heating equipment to the company lines. In addition the departments were successful in selling a large number of ranges and water heaters. There were a total of 269 furnaces and boilers sold and installed during the month.

The departments reported sales and installations of 379 ranges which is considered an excellent job for the month of August.

Sales and installations of automatic storage water heaters totaled 217.

Total sales of all equipment for the month amounted to 1,507 appliances.

Birmingham Gas Co. Sells Two Carloads of Ranges

Two carloads of fully-equipped gas ranges or about 150 were recently sold in one order by the Birmingham Gas Company to the J. Warren Leach Company, apartment house operators of that city.

This represents the largest sale recently made by this company which has been very active of late in inducing apartment house owners to modernize their kitchens and scrap the obsolete gas stoves many of which have been doing duty for 10 years or more. With the new models installed tenants get a much more favorable opinion of gas cooking which helps with sales to them when they buy their own homes.

The two-carload order consisted of Hardwick gas ranges (Hardwick Store Co., Cleveland, Tenn.) with porcelain finish, oven heat control, insulated oven and automatic top burner lighter, also cover-all tops.

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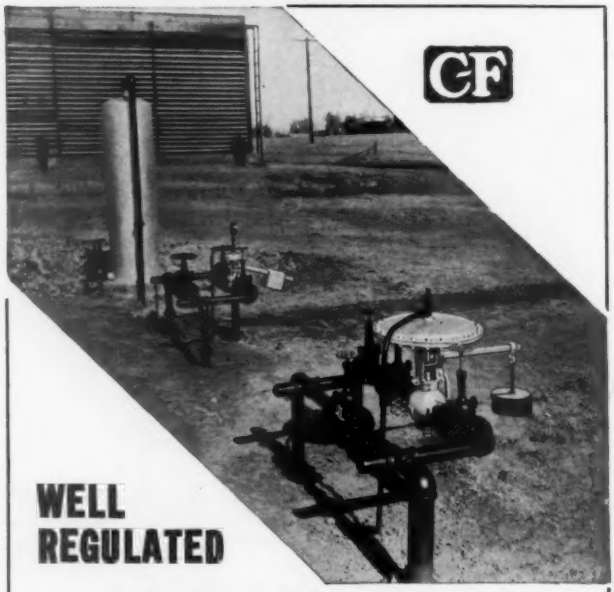

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Pipe Corrosion & Coatings

Enamel Application—Slings Coupler Coatings—Whitewashing—Tests of Coatings

Part 28

By Erick Larson

THE two basic methods of field application of enamel are (1) by a sling, in which case the pipe is stationary; and (2) by pouring onto a revolving pipe, which necessitates the use of a spreader. Both methods are satisfactory. The sling method is more commonly used on pipe up to and including 12″ in diameter, and the revolving type method on larger sizes.

At mills all pipe is revolved, as the pipe is run through the machine continuously; but not more than three lengths are coupled together at any one time. Revolving the pipe simplifies the application of a wrapper.

Placing of Pipe for Enamel Application

The pipe to be coated should be placed on skids a sufficient height above the ground to prevent any contact of the sling or pipe with plants, rocks or soil. Any plant growth near the pipe should be cut down before the enameling operation is commenced. In wet or swampy sections the pipe should be sufficiently elevated to avoid water being splashed onto it by men walking nearby. When snow lies on the ground the pipe should be high enough above the surface to avoid possibility of snow drifting against it and introducing the danger of moisture.

No pipe should be coated with enamel until the primer is in the proper condition.

Sling Application

Sling application consists in pouring the enamel over the top of the pipe and distributing the material which flows to the bottom by a canvas sling, or as it is sometimes termed, a "granny-rag."

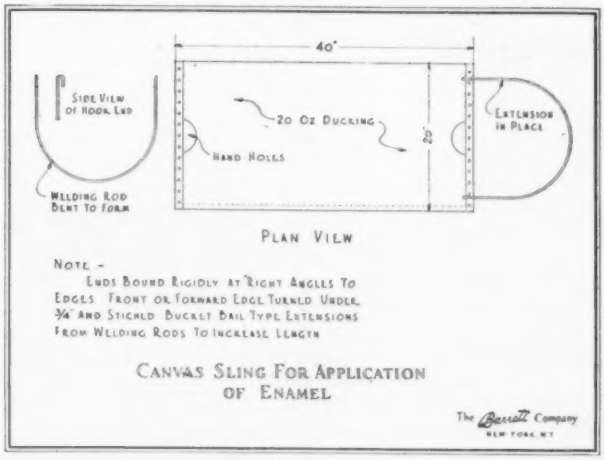
The sling application method wastes considerable material because some must be allowed to run continuously from the edges of the sling to prevent hardening at that point and to assure complete coverage.

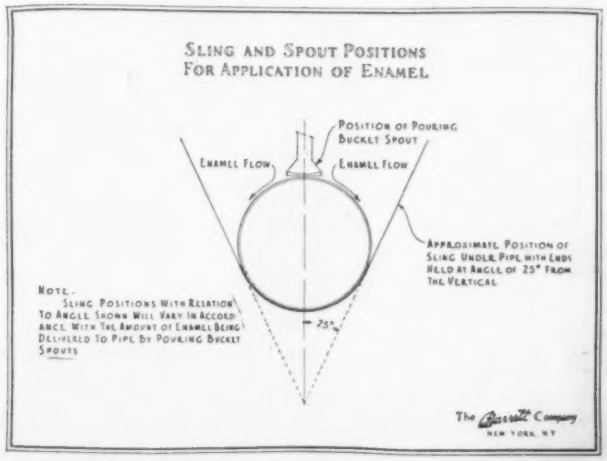
Keeping this loss at a minimum, maintaining the proper speed of application and securing a uniform coverage of the desired thickness requires experience. Therefore, the enameling crew should be at least semi-skilled men and carefully supervised. Some important factors which result from experience are the proper angle at which the slings should be held in order to secure uniform distribution on the sides, the necessary tension of the slings against the bottom, motion of the sling, amount of enamel to pour, position of spout with respect to sling and when the enamel in the pouring kettle is too cold to apply.

The sling should be held with the holding edges parallel and the advancing edge approximately at the point where the enamel flowing from the top would drip from the pipe if not retained by the sling. No enamel should drop to the ground from the advancing edge of the sling and as little as possible should be allowed to flow from the following edge. The sling should be held with a sufficient tension to have the feel that it is against the pipe, but not with a sufficient tension to spread the enamel too thin.

On large sized pipe the pouring bucket man sometimes walks on top of the pipe. If this practice is followed other should bring him fresh supplies of enamel. He should avoid stepping onto the ground. Periodically stepping from ground to pipe will result in foreign material being carried onto the primer. Walking on tacky types of primer may also result in scraping some off of the pipe.

An enamel sling should not be placed on the ground when not in use, as this will result in its picking up foreign materials. When it is desired to remove the sling from the pipe, one of the operators should retain his hold on it until the other has raised his end sufficiently to avoid contact with the ground.


40"
Side View of Hook End
20 Oz Ducking
Hand Holes
20"
Extension in Place
Welding Rod Bent to Form
Plan View
Note -
Ends Bound Rigidly at Right Angles To Edges Front or Forward Edge Turned Under, ¾" and Stitched Bucket Bail Type Extensions From Welding Rods To Increase Length
Canvas Sling For Application of Enamel
The Barrett Company
New York, N.Y.


Sling and Spout Positions For Application of Enamel
Position of Pouring Bucket Spout
Enamel Flow
Enamel Flow
Approximate Position of Sling Under Pipe with Ends Held at Angle of 25° From The Vertical
25°
Note -
Sling Positions With Relation To Angle Shown Will Vary In Accordance With The Amount of Enamel Being Delivered To Pipe By Pouring Bucket Spouts
The Barrett Company
New York, N.Y.

With the sling method the pouring kettle spout should have its mouth at right angles to the longitudinal axis of the pipe. The spout usually rests directly on, and with its center at the very top of the pipe.

Enamel Slings

Slings for the application of enamel are made from good quality 18 to 24 ounce weight canvas duck. The canvas should be cut and bound truly rectangular. There should be no wrinkles, knots or buckles in the surface.

The dimensions of an enamel sling are somewhat dependent upon conditions in the field. Where the pouring is from awkward positions the width may have to be increased to prevent excessive loss of coating material. The minimum widths here tabulated are preferable when possible, as they have generally been found to give the best results. The length depends upon the distance operators must stand from the pipe being coated. The canvas may be lengthened, or the handles may be increased in length.

Recommended Sling Sizes

Diameter of Pipe	Width of Sling	Length of Sling
2″ to 6″	16″ to 20″	30″ to 40″
6″ " 12″	20″ " 24″	36″ " 44″
12″ " 16″	24″ " 28″	40″ " 44″
16″ " 20″	28″ " 32″	44″ " 48″

The dimensions of a sling are of sufficient importance to warrant close study, as material may be saved and convenient working conditions will decrease the time required for applying a coating.

Revolving Pipe Method

The revolving method requires equipment which will revolve the pipe and a means of spreading the enamel when poured. The revolving equipment may be manually operated or power driven. While distinctly different than the sling method, experienced operators are essential to insure uniform coverage of the specified thickness. Therefore semi-skilled labor should be used.

Pipe of a larger diameter than can well be handled by the sling method may have the coating easily applied by the revolving method. A disadvantage is that the application must be limited to one or two lengths of pipe, and the joints must be protected after connections have been made. While small diameter pipe may be coated by the revolving method, the sling method is usually used up to and including 8″ pipe. Even larger diameter pipe may be coated by the sling method where conditions are satisfactory.

The rotating equipment should be installed so as to eliminate possibility of any contact of the pipe with the ground or growths. The drive shaft or other revolving parts of the motorized units should not be in a position to throw foreign matter, oil or moisture onto the pipe.

Revolving Equipment

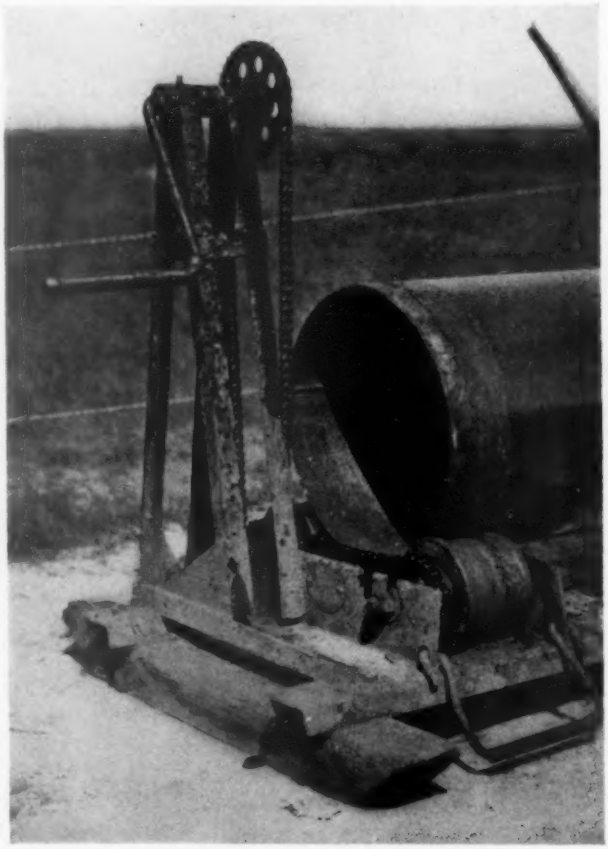
The equipment is most frequently made up in the field or some local shop. The illustrations indicate the simplicity of equipment which produces the desired results. A uniform speed is essential, and accounts for operators preferring power-driven units.

The speed at which the pipe is rotated depends upon the experience of the operators. Experienced crews with favorable working conditions can satisfactorily apply enamels to pipe whose surface is travelling at 100 feet per minute. This would mean revolving 12″ diameter pipe at the rate of approximately 33 R.P.M. An average speed of 25 R.P.M. would be a more usual rate for all sizes. On small pipe the speed is limited by the rate at which the bucket man can walk along the pipe. Another limitation on speed is centrifugal force which tends to cause non-uniformity of the coating thickness.

Many methods of revolving the pipe are used, such as pneumatic, electric or motorized power units, either direct connected or operating through jacks or idlers. The essential requisite is to have sufficient power to rotate the pipe uniformly and with no delays. It is desirable to have flexibility of control so that the speed may be changed as desired.

Enamel Spreaders for Rotating Method

Spreaders are of two general classes. The one is attached directly to the pouring bucket; and the other is an entirely separate unit, necessitating one or more additional operators. The second method sometimes employs a metal shoe or more flexible spreader held by a single operator, or a sling held beneath the pipe by one operator on small pipe and two on larger sizes.



Courtesy The Barrett Co.

Pipe Revolving Equipment.

The method using an attached spreader usually requires less labor, but the results are not as uniform as with the second or detached method. The weight of an attached spreader is important in securing proper thickness and uniformity. The spreader width, if excessive, makes it difficult for the operator to be certain that an overlap is secured on each spiral of enamel.

The enamel is poured on the up-coming side of the pipe, and the bucket is held so that the attached spreader is directly on top of the pipe.

With separate or detached spreaders the enamel is poured on the up-coming side of the pipe, and the spreader held sufficiently close to mold or spread the enamel while it is still fluid. Experience is required to

Courtesy The Barrett Co.

Enameling Revolving Pipe Showing Use of Spreader.

hold the spreader at a uniform distance from the pipe to secure the proper thickness. A tilting of the spreader relative to the pipe surface may cause one edge to cut the enamel.

When a sling is used it is held by one or two men without any movement except forward in the direction of coating. Enamel is poured into the sling on the down-going side of the pipe and the sling acts as a spreader. Much faster revolving speeds can be used with this than other methods after crews have become experienced. Where two men hold the sling, care should be taken to keep a uniform tension so that the rear edge of the sling will neither cut the enamel nor allow excessive thickness. This method may result in the greatest amount of waste unless bucket men are especially careful and skilled.

Double Coating

There are instances where circumstances result in a decision to protect a pipe without the use of a wrapper. A practice sometimes followed in such cases is to double coat welded circumferential joints. Welded longitudinal seams are treated likewise. The second application is most conveniently applied with a dauber, as it is extended only a couple of inches each side of the welded seam. The purpose of the double coating is to eliminate pinholes or voids.

Coating Pipe Couplings

Slip couplings and other similar types of joints add to the difficulty of protecting a pipe line against corrosion. The several parts of such couplings usually have thicker walls than the pipe, and therefore under ordinary circumstances might be expected to outlast the pipe if both were unprotected. However, there are certain parts of such joints which may be more susceptible to electrolysis than the flat pipe surface. Therefore, it is good practice to protect coupling type joints. In some cases they have been protected with enamel, but this offers many practical difficulties; and should it be desired to take the joint apart, an unusual amount of time is required.

Coupling Forms

Enamel may be applied to coupled joints by daubing, but more frequently this is done with a form. The form may be of metal sufficiently flexible to conform to the contour of the coupling, with spacers between it and the pipe to assure that protection is afforded to every part. With such simple forms the ends of the coupling and the cut-back portion of the pipe are usually coated by daubing.

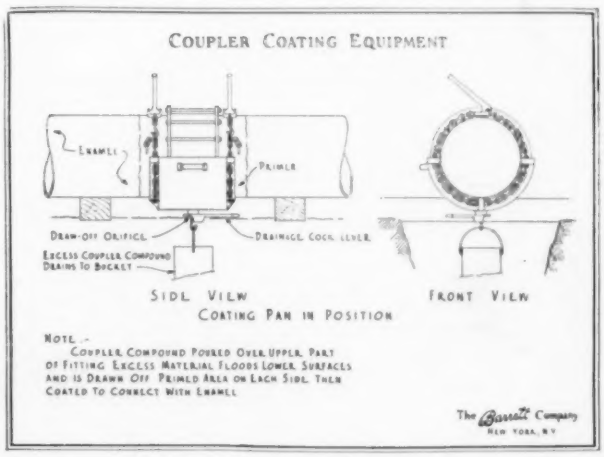
An improvement on this simple device is a hinged metal or wood form which extends at an angle from the edges of the coupling to the ends of the enamel originally applied to the pipe. An opening is left in the top of the form, and the enamel poured in. Care must be exercised to assure that the enamel runs to the bottom of the form.

Wood slats hinged together make a flexible form. However, all such forms require the use of an excessive amount of material.

The forms may be readily removed if the inside surface is whitewashed previous to use, thus preventing a bonding action between the metal and enamel.

Coupler Compound

Coupler compounds may be of the bituminous or grease types. When of a bituminous nature, the coupler compound is basically the same as the enamel, but of a much lower melting point. At normal temperatures the coupler compound has sufficient flexibility to provide for bending at the joint without cracking during laying of the pipe. The coupler compounds usually have a maximum allowable temperature of approximately 300°F., and may be applied 25 to 50°F. below the maximum.


COUPLER COATING EQUIPMENT
ENAMEL
PRIMER
DRAW-OFF ORIFICE
DRAINAGE COCK LEVER
EXCESS COUPLER COMPOUND DRAINS TO BUCKET
SIDE VIEW
FRONT VIEW
COATING PAN IN POSITION
NOTE —
COUPLER COMPOUND POURED OVER UPPER PART OF FITTING EXCESS MATERIAL FLOODS LOWER SURFACES AND IS DRAWN OFF PRIMED AREA ON EACH SIDE. THEN COATED TO CONNECT WITH ENAMEL
The Barrett Company
NEW YORK, N.Y.

The enamel type coupling compound is poured over the top of the joint and allowed to run down. The excess is usually retained in the bottom of a form which surrounds only the lower half of the pipe. Providing this reservoir assures the complete coating of the bottom of the coupling, and the excess is then drained before it has hardened. The drained material is returned to the heating kettles.

Such coupler compounds do not provide the protection afforded by enamels, and are used only because of the ease of application. When using coupler compounds it is generally desirable to leave the form in place. Wood forms in particular, even though only of veneer thickness, absorb some of the compound and act as a shield.

Heavy canvas, or even light cardboard have been employed as forms; but their value as a shield is practically nil. The heavy canvas form is the most convenient, and is easily removed.

Priming for Coupler Compound

It is necessary to prime all parts to be covered by a coupler compound which must be melted before applying. All the practices followed for the priming of a

pipe surface are followed on the couplings. Usually the various parts of the coupling are primed before assembling. The practice of dipping such parts may be advantageously followed, except for the portions which will be exposed to the gas stream inside the pipe and the contact surface between gaskets and coupling. Inside the pipe the compound may become eroded or flake off, and such particles may be carried to burners and interfere with their operation. Gaskets may not seat properly if held non-uniformly by differences in the tackiness of the primer.

Coupler parts which have been primed should be protected from contact with foreign matter. There is more tendency to be careless with small parts than with a pipe line. All the rules of primer application to the pipe apply also to the priming of parts to be protected with coupler compounds.

Covering Capacity of Coupler Compounds

The quantity of coupler compound required for a given job is more difficult to estimate than that of any other phase of protective material. The following table may be taken as representing the minimum requirements under favorable conditions.

Approximate Quantity Coupler Compound in Pounds Per Coupler

Pipe Diameter	Regular Style Couplers	Long Sleeve Couplers
36"	38 Pounds	68 Pounds
34"	36 "	64 "
32"	34 "	60 "
30"	32 "	56 "
28"	30 "	52 "
26"	28 "	48 "
24"	26 "	44 "
22"	24 "	40 "
20"	22 "	38 "
18"	20 "	35 "
16"	18 "	30 "
14"	16 "	26 "
12.75"	14 "	22 "
10.75"	12 "	18 "
8.62"	10 "	15 "
6.62"	8 "	12 "
4.50"	6 "	9 "
3.50"	4 "	6 "
2.375"	2 "	3 "

Courtesy of The Barrett Company

It is preferable to buy coupler compound properly mixed at the manufacturer's plant. In emergencies caused by running out of a supply, or when only an occasional coupling is placed in a line and the quantity of compound required does not warrant a special stock, enamel may be converted to a coupler compound. One gallon of flux to six gallons of enamel will produce a coupler compound for use during warm atmospheric conditions. Additional amount of flux may be required during cold weather. The flux should be thoroughly mixed with the enamel.

Fluxing Coupler Compound

A coupler compound is fluxed only when the temperature is so low that cracking occurs when the pipe is bent at the coupling. This may occur when laying the pipe in the trench. The quantity of flux to use for various temperatures is specified by coating manufacturers.

Wrapper Used as Form for Dresser Coupling Coating

For estimating purposes the following table may be used:

Flux to be Used with Coupler Compound

Atmospheric Temp. in Degrees F.	Gallons of Coupler Compound per gallon of flux
45° to 35°F.	25
35° to 25°F	17
25° to 15°F.	12
15° to 5°F.	10
5° to -5°F.	8

Whitewashing Enamel

Whitewashing enamels which are not shielded is for the purpose of maintaining the temperature of the coating at a minimum during exposure to the sun. As the temperature of an enamel rises, it becomes more plastic; and as a result, it is more subject to damage. Also, foreign matter will adhere to it and become imbedded in the material more readily than after the pipe has been covered and ground temperature has been attained.

Coated pipe should not be exposed to the direct rays of the sun, even when whitewashed, for any extended time, and should be buried as soon after coating as practical. When circumstances necessitate exposure, and the atmospheric temperature is expected to reach 80°F., it is good practice to paint the enamel with whitewash.

If enamel coated pipe is to remain, during hot weather, exposed to the atmosphere for more than a day before a shield is applied whitewash is painted on immediately after the coating has been applied.

Whitewash Formula

One pound of slacked lime to one gallon of water, and one pound of salt for each five gallons of water is a common proportion. The mix should be free of all foreign matter or lumps.

Inspect before Whitewashing

Visual or mechanical inspection for pin holes and holidays should be made before the whitewash is applied. A final inspection should be made of the whitewashed enamel just before burial, as any cracks which may have developed or holidays which have resulted from chipping are more readily detected than when no whitewash is used.

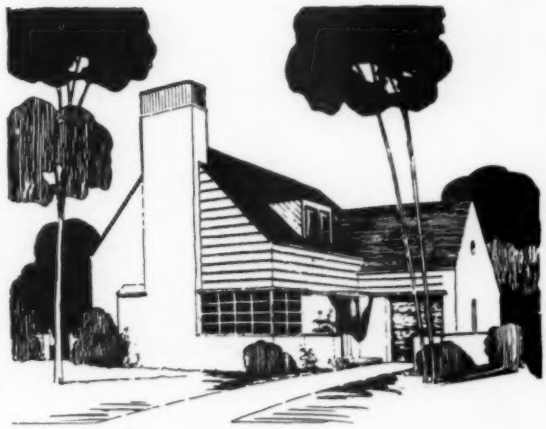
Whitewash Application

The whitewash is applied to all of the coated surface,

(Continued on page 86)

New Thousands Heat with Gas

Cleanliness and Convenience Coupled With Attractive Rates and Dealer Cooperation Get Results in East and West



MANIFEST accomplishment that is tantamount to triumph has been achieved by many sales departments of Gas Companies, east, west and south in selling gas heating for the home.

From six centers of activity in house heating campaigns we present individual stories in brief on how their campaigns were planned and executed.

While the gas industry was slow in achieving momentum in this important branch of its usefulness, the past year has shown a degree of progress that is the most impressive record in the entire field of heating.

Latest available figures, compiled by the American Gas Association, showed that the companies supplying manufactured gas had reached a total of 177,300 customers as of August 1, 1938. This compared with 149,600 for the corresponding period of 1937, a gain for the year of 27,700. Comparable figures for natural gas are not available, but it is reasonable to assume that the record for that fuel is still more impressive.

Effective sales efforts deserve much credit for the showing made, but not all of it. Every influencing factor has been brought into line. A study of house heating rates shows the influence of lower charges. In 1929, there were 43,000 house heating jobs on manufactured gas company lines. They used 14,056,000 M. C. F. of gas and the average rate was 84½ cents per M. Slow but continued progress was made right through the depression years and 1935 showed 132,000 homes gas heated, consuming over 35,000,000 M. C. F. at rates that average 20 cents per M. less, or 64½ cents. The average is now in the 50's and judging by results is acceptable to the public.

The gas industry is at last geared to obtain its just share of house heating. With the equipment manufacturers, rate experts and sales organization presenting a united front—with intelligent and persuasive promotion, it should increase the rate of acceleration in the coming year.

H. M. BRUNDAGE

House Heating and Air Conditioning Sales Policy in the Capital City

50% of All New Homes Employ Gas Heat —Cooking and Water Heating Over 90%

by

H. M. Brundage

General Sales Manager
Washington Gas Light Company

THE activities of this Company toward the sale of house heating and air conditioning are carried on by two separate sales organizations. Sales to domestic customers are secured by our Retail Sales Division; while the use of gas for heating and air conditioning in new home construction is promoted through our Gas Promotional Division.

Short summaries of the activities of both these organizations during recent months are as follows.

Retail Division

(Domestic Sales)

We have 14 salesmen selling water heaters and house heating equipment,

under the direction of 1 supervisor. City is divided into 7 sales territories and 2 men are assigned to each territory—one handling the even street numbers and the other the odd street numbers—giving each man a protected territory of approximately 6,500 meters.

These salesmen solicit house heating equipment orders in the field, canvassing from survey cards obtained as a result of a recent survey of every dwelling unit in the city. These cards show age and condition of customers' present equipment and other pertinent information, and sales efforts can in this way be directed on those people who are the most logical prospects for new heating equipment. Field salesmen also follow up prospects turned in by employees and cooperating plumbers and heating contractors. We usually have two major heating campaigns each year, one in the fall and the other in the spring with the privilege of no payment (other than small down payment) until fall. Salesmen are trained to measure houses and submit an accurate estimate of seasonal heating costs to customer, which, in case the sale is made, is confirmed by a survey made by our Utilization Department.

Most effective house heating sales tool is the "users book" which is compiled annually, listing the names and addresses, estimates, of actual consumers in our territory. Since the experiences of the overwhelming majority of these users shows their actual heating bills to be considerably under our estimate, this enables our salesmen to impress the customer with the conservatism of our figures and show him the satisfactory experiences of his friends and neighbors who use gas for heating.

All heating equipment sold through our company has been carefully tested by our laboratory to assure customer satisfaction under local conditions. The high grade of prompt, free, 24 hour service extended by our Company is another asset of great importance to our salesmen.

We use direct mail, newspaper, window display, and truck poster advertising during campaign periods.

Cooperation with Contractors

Plumbers and heating contractors work closely with our salesmen in obtaining heating installations. These trade members are furnished with prospect books and protected on any leads furnished to our office for a period of 90 days. We have a plumber relations representative who devotes his entire time to making plumbers "merchandise" minded and to handling all their complaints and other contacts with the company. Plumbers are paid a liberal commission on jobs sold as a result of their leads and are permitted to (at customer's request) install gas fired boilers taken on company contracts with their cooperation, although company installation department must install all conversion burners. While these trade members are an important factor in space heating merchandising, they are by far more valuable in promoting automatic water heater sales than any other gas appliance.

For results, in 1937, we sold in the retail or replacement market, 739 house heating installations. For the first 7 months of this year, despite unfavorable business conditions, we are running about 18% ahead of the retail heating installations for the same period of last year.

Gas Promotional Division

New Construction—Sales Promotion

The Promotional Division of our company is so organized that there is ample man-power to adequately cover its scope of work in the territory which the company serves.

WELCOME NEWS!
$188.55
BUYS A COMPLETELY
AUTOMATIC
Gas
HEATING
UNIT
Call
DIstrict 8500
FOR FREE AND ACCURATE ESTIMATE OF THE YEAR 'ROUND COST OF GAS HEATING IN
your home
Small amount down
NO FURTHER PAYMENTS UNTIL NEXT SEPTEMBER
It takes but a few hours to have one of these efficient Automatic Gas Heating units installed in your present furnace . . . then you're free from furnace tending for the rest of your life! If you wish to buy on terms, a small down payment will install it, and you need make no further payments until next September!
With this price, and these easy terms . . . occasioned by the rapidly increasing demand for Gas Heating . . . there is no reason why you should not change NOW, and put furnace tending, fuel ordering, storing, and all of the other inconveniences of non-automatic heating forever behind you.
Don't let anyone tell you that you can't afford Gas Heating. Get the facts by calling the telephone number at the left. Do it NOW!
YOU CAN AFFORD GAS HEAT--
let us prove it!
WASHINGTON GAS LIGHT COMPANY
411 10th St. N. W. 1339 Wisconsin Ave. N. W.
District 8500

This 5 column 16½ inch high newspaper advertisement was one of a series. It calls attention to complete cost of unit and time payment plan. It also invites a telephone call.

Its activity centers around the fundamental purpose of a public utility sales department; i.e., to obtain increased gas burning appliance installations. Its activity is of a broad nature, covering all new construction work as well as large apartment house replacements.

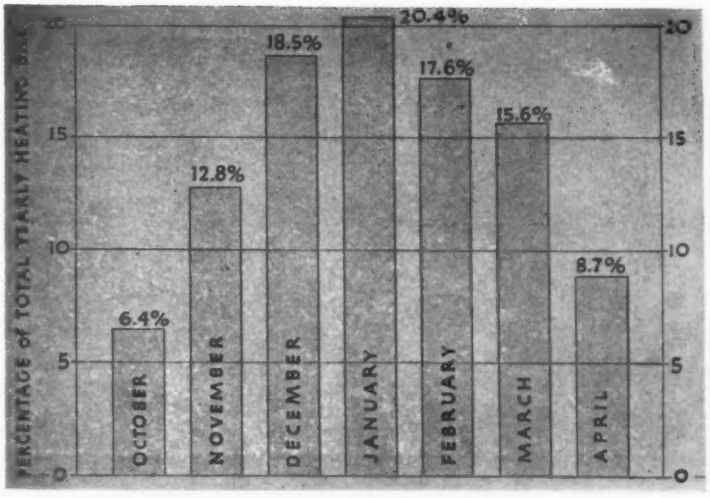
It confines its workings to strictly promotional selling; that is, the merits of the fuel and the service which it represents rather than actual merchandising.

Procedure

Building contractors comprise a group that have arisen to their present occupation from many walks of life. A good percentage have advanced from the mechanical trades; some are primarily investors; others, salesmen; occasionally, they are builders through avocation only. If they enjoy any one thing in common it is perhaps a certain independence of thought and conviction that their one method is best, evidence to the contrary often notwithstanding. In dealing with them, it has been found expedient to vary the method of approach. Some have to be completely resold on every job; others voluntarily designate gas equipment routinely. Being always mindful of alert competition demands that every job be watched closely throughout the entire program of construction.

Initial contact is usually made with the architect, owner or speculative builder through the medium of F. W. Dodge Corporation reports, the common source of advance data on new construction. The first information sought is the identity of the general contractor, as custom dictates that transactions be conducted through him. A step by step analysis of the calls and their reasons are herewith listed:

1. Initial contact made.
2. Blueprints secured, if possible, to submit an estimate for gas heating, boiler size, etc.
3. Certain approved kitchen, as well as basement equipment recommended.
4. Recheck to follow up the placing of the necessary orders with the representative dealers.
5. Check kitchen layouts to provide adequate space, etc., for Electrolux installations.
6. Meter application signed, if necessary.
7. Sunday call assistance rendered, if speculative construction.
8. Courtesy call on ultimate purchaser of speculative homes.



In a booklet entitled "Lost Heating Dollars" this chart is used and explained as follows:—

The estimate you received was for a whole season of gas heating. Let's say that estimate was $100. People are prone immediately to divide that $100 by 7, the number of months in the normal heating season, and arrive at $14.28; then expect each monthly bill to amount to that figure. The chart will give you a clear idea of how heating costs vary by the month during the heating season.

Thus on the basis of a $100 estimate, the normal January bill would be about $20.40, not $14.28.

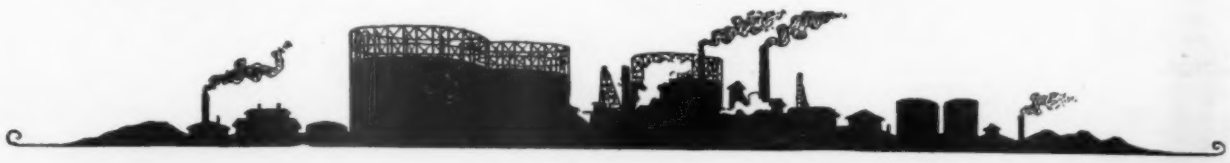
If your gas bill for heating continues to mount during January and February, do not be alarmed, for it is perfectly normal, and over the whole season, you will find that your costs will follow closely the anticipated figure.

Owners of contract houses usually require considerable attention to insure the installation of gas heating equipment when not originally specified by architects. Where a promotional representative gives concerted effort along these lines, results are favorable in the majority of cases. This is likewise true of refrigeration, cooking and water heating.

The prompt sale of hundreds of gas heated homes bespeaks a favorable public attitude toward that fuel and has been responsible for an increasingly receptive attitude among the speculative builders. However, to enjoy this enviable position required continued promotional effort with builders, heating contractors, architects, et cetera.

Direct mail programs, as well as other aids to cooperative dealers, have lent themselves to unite forces in securing gas sales through the medium of appliance installations.

In conclusion, it might be said that the department as a whole is conducted on the basis of efficiency. Consolidation of a number of activities relating to new mains and service installations has resulted in a better type of service, which is always appreciated by the builders. Results of the above activity have been most gratifying. Gas house heating is now being employed in approximately 50 per cent of all new homes; gas refrigeration, in about 66 per cent; cooking and water heating, in the 90's.



Gas House Heating Swings Jersey

To The Tune of 2,000 More Homes a Year, the Public Service Company Carries on Its 12-Year Program

by
H. Preston Morehouse
Public Service Electric and Gas Company

GAS heating has been actively promoted by Public Service for about twelve years. Each year has ended with an increase in installations over the previous year. In 1935 a rate reduction was put into effect which brought all gas used above 10 M.C.F. per month down to 50c per M.C.F. At the time this rate reduction was put into effect two other sales promotional plans were adopted, namely; a One Year Trial Plan and Budget Billing on a ten month equal payment arrangement. On January 1st, 1938, the One Year Trial Plan was conceded to have served its purpose in getting considerable public acceptance for gas heating and it was discontinued.

Gas heating for residences and commercial establishments, is solicited by a group of about forty Heating & Air Conditioning Representatives. In addition to heating, these men also solicit summer air conditioning both by gas and electricity.

Selection of Salesmen

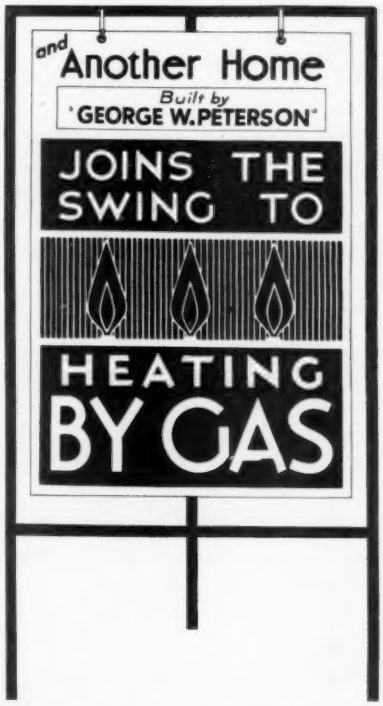
Our heating salesmen are usually selected from our sales department. Selections are based on previous sales records and educational background. Before these men are assigned they take a two month course with the company. This careful preparation and training we feel is extremely important and one which pays large dividends both in increased sales and a public reputation for reliable statements. Each cadet spends some time at the Works, Distribution, Customer Service, Bookkeeping and Billing Departments. They also spend a day in the sales offices of the leading heating appliance, control and insulation manufacturers, to get first-hand knowledge of the equipment and their sales personnel and policies. A course of instruction is given by Public Service in survey, and estimating work and case problems are studied. Assignments are given in home study work on technical and sales preparation. Each man is required to take the Rutgers Extension Course in Heating, Ventilating and Air Conditioning.

Selling Is Carefully Planned

The actual sales preparation is based on a study of the sales tools with which the salesman is equipped. Two weeks of field work as an apprentice in making surveys and observing sales presentations by trained men completes the course. A three day examination on Theory, Practice and Sales Presentation, is then given to each prospective salesman. We have gone into the sales training in some detail because of its importance in building a good sales organization for productive results.

The sales tools just mentioned are also extremely important. A great deal of money in promotional activities is spent to get the name of a prospect. How we handle that prospect which we have put so much effort into getting is surely a very important matter. Selling the best and most expensive fuel requires a high order of salesmanship and we feel we can't afford to use slipshod sales practices. Two sales tools have been developed which are important. All sales objections met in the field have been studied. The best and most convincing answers to these have been worked out and charts, tables, pictures and other supporting data, have been prepared and assembled into a zipper binder known as the Automatic Heat Manual.

This Manual has such sections as Institutional, Public Acceptance, Heat Conservation Materials, Oil Heating, Coal Heating, New Construction, Modern Basement and Domestic Hot Water. It is prepared like a visualizer but is not used in the manner common to visualized selling. After a survey is made a bound proposal is prepared. This proposal is made the vehicle for the sales presentation. Each page of the proposal forms a basis for covering certain sales advantages. The salesman follows the proposal in his presentation and uses the visualizer only to answer objections and drive home sales points.



This lawn sign at the site of a new home under construction flatters architect, builder and owner.

The salesmen are paid on a salary plus a load building bonus. An equal bonus is paid no matter whether the salesman sells the merchandise or a dealer sells it. Under this plan competition between the independent dealer and the gas company salesman ceases.

Sales Factors Employed

Each year from eight to ten pieces of direct mail designed by the gas company are sent out to a mailing list of single family home owners. The points stressed in this advertising are; The cost of heating with gas is low; and there is a big swing to gas heating. Newspaper ads carry the same kind of message and appear periodically in the daily papers.

Billboard advertising on gas heating is used in strategic locations for about two months each year.

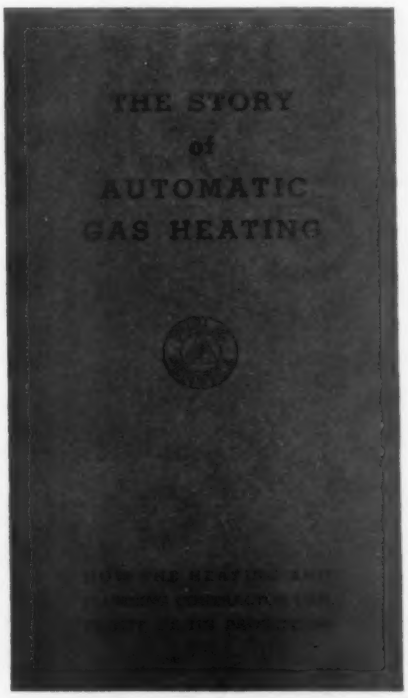
Window displays for our offices are used regularly. Window displays specially designed for the deal-

er are prepared for plumbers and specialty dealers.

Each year we prepare a sound slide film setting forth the progress of gas heating tieing in the human interest angles. In 1938 we used "The March of Gas" based on The March of Time. This film is shown before group meetings of employees, architects, builders, dealers, realtors and social clubs. It has been found extremely effective in keeping all interested groups posted on the progress being made by gas heating.

Another important and effective promotional device has been the lawn sign. On the lawn of every new home installing gas is placed a large attractive metal sign. This sign ties in the dealer or builder's name. It is most effective because new homes are visited by architects, builders, realtors, dealers and the house buying public. Such an effort sponsored by the gas company allows a uniform sign to be placed on each new job regardless of what manufacturer sold the equipment. Our competition lacks such a unified plan and thus while we may actually be trailing competition in some areas, the unified sign conveys to the mind of the public that there is a big swing to gas.

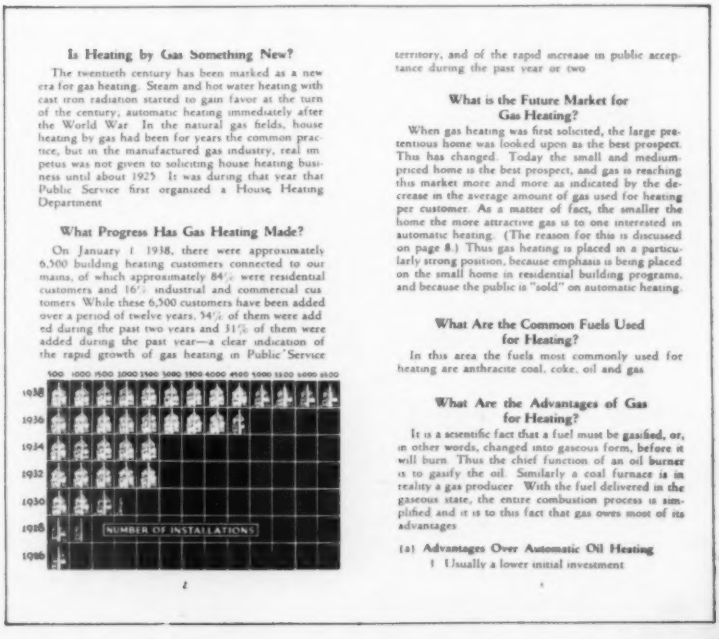
Several years ago we sponsored a slogan for gas heating. This slogan,



Cooperating Contractors learn the advantages of gas house heating, told briefly and clearly in this 16 page 4 x 7 inch booklet dedicated to their use. Reproduction of two sample pages are shown.

Vacation's Over—
Prepare for Winter
Better Look to
Your Heating
Equipment
COST OF
GAS HEAT
IS DOWN
Look around before you install another heating system. Gas heat is the choice of 7500 New Jersey people.
There is no dirt, ash or soot in GAS automatic house heating. Investigate.
Preserve the benefit of your vacation by installing automatic GAS heat. Don't argue with a balky old furnace.
Don't be misled by first impressions.
JOIN THE SWING TO
HOUSE HEATING
BY GAS
PUBLIC SERVICE
PLEASE DON'T LEAVE LITTER

This is one of a series of 14 quarter page newspaper advertisements used at intervals. This was scheduled for use in September 1938. Each includes the insignia "Join the Swing to House Heating by Gas."



Is Heating by Gas Something New?

The twentieth century has been marked as a new era for gas heating. Steam and hot water heating with cast iron radiation started to gain favor at the turn of the century; automatic heating immediately after the World War. In the natural gas fields, house heating by gas had been for years the common practice, but in the manufactured gas industry, real impetus was not given to soliciting house heating business until about 1925. It was during that year that Public Service first organized a House Heating Department.

What Progress Has Gas Heating Made?

On January 1 1938, there were approximately 6,500 building heating customers connected to our mains, of which approximately 84% were residential customers and 16% industrial and commercial customers. While these 6,500 customers have been added over a period of twelve years, 34% of them were added during the past two years and 31% of them were added during the past year—a clear indication of the rapid growth of gas heating in Public Service territory, and of the rapid increase in public acceptance during the past year or two.

What is the Future Market for Gas Heating?

When gas heating was first solicited, the large pretentious home was looked upon as the best prospect. This has changed. Today the small and medium-priced home is the best prospect, and gas is reaching this market more and more as indicated by the decrease in the average amount of gas used for heating per customer. As a matter of fact, the smaller the home the more attractive gas is to one interested in automatic heating. (The reason for this is discussed on page 8.) Thus gas heating is placed in a particularly strong position, because emphasis is being placed on the small home in residential building programs, and because the public is "sold" on automatic heating.

What Are the Common Fuels Used for Heating?

In this area the fuels most commonly used for heating are anthracite coal, coke, oil and gas.

What Are the Advantages of Gas for Heating?

It is a scientific fact that a fuel must be gasified, or, in other words, changed into gaseous form, before it will burn. Thus the chief function of an oil burner is to gasify the oil. Similarly a coal furnace is in reality a gas producer. With the fuel delivered in the gaseous state, the entire combustion process is simplified and it is to this fact that gas owes most of its advantages.

(a) Advantages Over Automatic Oil Heating

1. Usually a lower initial investment.

AUTOMATIC GAS HEAT
The progress in heating methods from one den to another has been marked. Mr. Paleozoic Man was concerned chiefly with getting enough food and keeping warm. Mr. Modern Man has many more concerns, but the heating problem is just as important. He has chosen gas automatic house heating to solve it for him.
7 rooms
$14.92
monthly on a ten months basis
The occupants of this seven room house do not dread the annual heating season. For $14.92 monthly, based upon the ten months budget plan, they have enjoyed gas automatic house heating. Their savings in labor, in cleaning bills, and in heating worries have alone justified the investment. Consult your plumber, dealer or heating contractor for further information.
Relaxation with his newspaper is the birthright of every man. If he has no household worries, if there is no necessity to rattle the furnace grates or to consider the heating problem, his relaxation can be complete. Gas automatic house heating alone is wholly automatic and alone can give him the out of sight, out of mind operation which he has a right to expect. Gas, the ideal fuel burned in tested equipment, provides a constant heat which can be had in no other way.
JOIN THE SWING TO HOUSE HEATING BY GAS
PUBLIC SERVICE

One of a series of ten direct mail pieces in four colors sent out at various intervals and timed to the season. This shows one side only and measures when opened 15½ x 11 inches.

with its definite arrangement of wording and gas flames, has been used throughout our advertising on billboards, direct mail, newspaper ads, lawn signs, window signs, etc. This slogan "Join the Swing to Heating by Gas" has now become a national one* and has been adopted by gas heating appliance manufacturers and utilities throughout the country, thus proclaiming a national "Swing to Gas" for heating. Such a national coordinated effort should be very effective.

Dealer Cooperation

We work very closely with the trade in the promotion of gas heating. All boilers are installed through them. We install conversion burners sold by us. Frequent meetings are held with the plumbers and a very friendly relationship exists to the point where the plumbers are responsible for originating the sale for a considerable portion of our gas heating business.

Within the past two years specialty dealers with a selling organization have found it profitable to sell gas heating. They are given every cooperation and there is no unfriendly competitive spirit between them and our salesmen. Some of the help extended to the dealer consists of; helping to get salesmen, training these salesmen and their supervisors, making surveys, sales help in closing sales, servicing of their equipment after it has been approved and installed. Approximately 50% of our total sales are now going through the specialty dealers.

Plumbers and dealers are encouraged to build up their own mailing lists and to send out manufacturers' literature to this list.

All new construction is handled through the dealer, or plumber, and this end of the heating business is gaining rapidly.

Results Achieved

Starting with a very few installations in 1925, we now have nearly 7,000 heating installations. We are now adding them at the rate of about 2,000 a year.

The results with new construction have been particularly encouraging. During 1937 nearly 700 new homes installed gas and about 75% of them chose winter air conditioning. In some towns we are getting better than 60% of all new construction on gas heating. Up to August 27th of 1938, 1144 installations were sold and 588 of these were sold to new construction.

* *See American Gas Journal, August, 1938, pp. 35-36.*

FIRE A FURNACE —ME?

No, I'm no lollypop — but I have my rights and one of them is the right to *automatic gas heat.* Dirt and ashes for the gals who still want to bear that yoke! I'll take mine with GAS!

Your customers — of the "gentler sex" especially — will respond to that kind of sales appeal. The emancipation of American womanhood from the coal-shovel-and-ash-can brigade is proceeding rapidly. Women *want* gas—why not talk their language? Show them how easy and reasonable in cost it is to convert their present coal-fired heating equipment to clean, dependable GAS heat—with a BARBER burner.

The "B" Model shown comes in 8 sizes for round grates 12″ to 34″ in diameter. There is also a wide range of sizes for oblong grates. Patented BARBER Jets insure complete combustion, with a "scrubbing" flame action on walls of firebox. No fire brick or refractory elements needed. Baltimore Safety Pilot. Listed in A.G.A. Directory of Approved Appliances. Ask for Catalog and Price List on Conversion Burners for Furnaces and Boilers, Burner Units for Gas Appliances, and Gas Pressure Regulators. We supply sales folders, at your request, for mailing to your customers.

No. 324—B BARBER Automatic Burner

THE BARBER GAS BURNER CO., 3704 Superior Ave., Cleveland, Ohio

Address Michigan Inquiries to The Barber Gas Burner Co. of Michigan, 4475 Cass Ave., Detroit

BARBER *Automatic* JET GAS BURNERS

A new sales weapon that substitutes...

ATTACK FOR APOLOGY

DON'T APOLOGIZE FOR THE COST OF HEATING WITH GAS

LOWER the cost with the Republic HEET-RE-TREEVER

DON'T APOLOGIZE FOR UNCOMFORTABLE FLOORS AND BASEMENTS

MAKE the entire home comfortable with the Republic HEET-RE-TREEVER

DON'T APOLOGIZE FOR PROPERTY DAMAGE DUE TO CHIMNEY DETERIORATION

ELIMINATE the use of the chimney with the Republic HEET-RE-TREEVER

The Republic HEET-RE-TREEVER is an automatic system of mechanical evacuation wherein the use of the conventional chimney is eliminated and the major portion of the heat content of the flue products is "retrieved."

Obviously such a system to be safe as well as economical must have a well-planned control sequence and design.

The Republic HEET-RE-TREEVER now has a proven record of performance in hundreds of homes over the past three years.

It can be stated conclusively that—

1. The Republic HEET-RE-TREEVER does *materially* reduce the cost of heating with gas.
2. The Republic HEET-RE-TREEVER does *materially* improve comfort at the floor zone and make the basement livable.
3. The Republic HEET-RE-TREEVER does eliminate the possibility of chimney deterioration due to gas heating.
4. The Republic HEET-RE-TREEVER is safe.

NOTE: Although the combination of the HEET-RE-TREEVER with the Republic Conversion Burner constitutes the ideal heating arrangement, yet the HEET-RE-TREEVER is designed for use in connection with any form of automatic home-heating with gas—whether conversion or gas designed.

Prices, specifications, and full details available from home office or branches.

AUTOGAS CORPORATION

2258 Diversey Pkwy. Chicago, Ill.

General Sales Agent REPUBLIC HEATERS SALES CO. CHICAGO, ILL.

Brooklyn Dealers Help Gas Company Sell 6,000 House Heating Jobs

Program Backed by Cooperation Holds Fast Pace Through 2½ Years; 99% Stay in Service

by
William B. Hewson
Supervisor House Heating Division
The Brooklyn Union Gas Company

IT is the customer who buys gas heating rather than the salesman who sells it.

This company stayed out of the house heating field until this wonderful convenience could be offered on a basis which would permit customers to talk about it favorably. In 1935 this company reached the point where, by a satisfactory heating rate and the much improved appliances then available, it felt that the time had come to sell house heating aggressively.

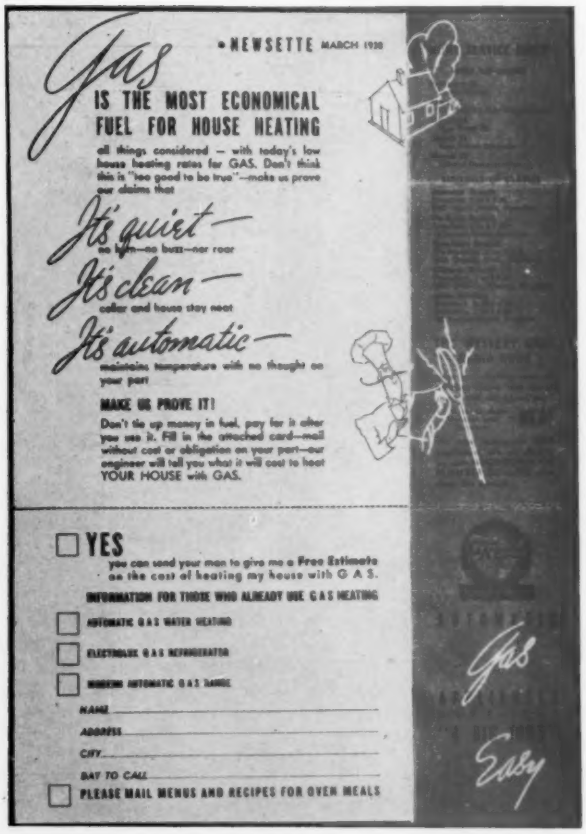
We were fortunate in having an unusually well equipped sales force, especially qualified to sell ranges, refrigerators and water heaters. It was decided, using these people as a nucleus, to enlarge this group and provide them with basic information on the engineering side of gas house heating rather than to employ specialists to sell house heating only. Forms were devised for the use of the students from which it was possible to provide case studies. The sales force had a series of meetings extending over the first year of operation at which various forms and their use were painstakingly studied. As a result, in a very short time, aided by a highly skilled group of supervisory engineers, this sales force became very well informed. The value of the instruction was proved by the proficiency they showed in selling gas for house heating.

Supervision by Engineers

The customer buys. The salesman sells. But the purpose of employing

GAS HEAT
AUTOMATIC HEAT FOR COMFORT
EVEN HEAT FOR HEALTH
EQUALIZED FUEL PAYMENTS
WITH GAS HEAT YOUR BASEMENT BECOMES "PLAY HEADQUARTERS"
GET THE FACTS!
THE BROOKLYN UNION GAS COMPANY

One of the Broadsides, 21½ x 13½ inches sent to one and two-family houses with prepaid post card attached. Produced by offset process,—two color, brown and orange. The reverse side tells "Quick Facts" about gas heating, shows the juvenile "furnace man" and carries the addresses and phone numbers of eight branch offices.


NEWSETTE MARCH 1938
Gas
IS THE MOST ECONOMICAL FUEL FOR HOUSE HEATING
all things considered — with today's low house heating rates for GAS. Don't think this is "too good to be true"—make us prove our claims that
It's quiet—
no fuss—no buzz—nor roar
It's clean—
cellar and house stay neat
It's automatic—
maintains temperature with no thought on your part
MAKE US PROVE IT!
Don't tie up money in fuel, pay for it after you use it. Fill in the attached card—mail without cost or obligation on your part—our engineer will tell you what it will cost to heat YOUR HOUSE with GAS.
YES
you can send your man to give me a Free Estimate on the cost of heating my house with G A S.
INFORMATION FOR THOSE WHO ALREADY USE GAS HEATING
AUTOMATIC GAS WATER HEATING
ELECTROLUX GAS REFRIGERATOR
MODERN AUTOMATIC GAS RANGE
NAME
ADDRESS
CITY
DAY TO CALL
PLEASE MAIL MENUS AND RECIPES FOR OVER MEALS
Gas
Easy

BUSINESS REPLY CARD
THE BROOKLYN UNION GAS CO.
180 REMSEN STREET
BROOKLYN, N. Y.
FACTS PROVE VALUE . . . last year in Brooklyn and Queens more GAS appliances were bought than in any one year since GAS was installed . . . in more and more houses we find youngsters saying . . .
I'm the furnace man at our house We've got...
Carefree GAS HEAT
Once men dragged in wood for the cook stove, but they haven't done that for years! Now some men drag fuel for house heating. BUT YOU DON'T NEED TO BE ONE OF THESE MEN . . .
DON'T BUY FUEL UNTIL YOU HAVE READ OUR MESSAGE ON MODERN HOUSE HEATING INSIDE

"Newsette." The two sides of this 2-color red and green mailing piece 6¼ x 9 are shown. It includes a prepaid return postcard.

supervisory house heating engineers was two-fold: Primarily, it provided a check on every detail of a prospective installation. The secondary purpose was to make available a group competent to solve any operating problems which might arise.

Dealers Cooperate

The Brooklyn Union Gas Company has for many years worked strenuously in the development of mutually satisfactory dealer cooperation, and it was decided to extend this effort to include house heating. The company has always paid plumber-dealers a liberal commission on sales. It pays them connection charges which are large enough to leave them a fair margin of profit. Sales forces are compensated on a basis which makes it worth while for them to work with plumber-dealers in the interests of gas house heating all over the company's territory. As now arranged, the company engineers make the original survey and the company sales force assists the plumber-dealer in every way to complete the sale. This effort at cooperation has so won the confidence of the Brooklyn plumber-dealers that to-

Carefree Gas Heating provides a NEW HIGH in Living!
● With gas heat you forget you have a furnace, freed as you are from every heating responsibility even to the ordering of fuel. But that's not all! You get a big extra dividend in heat that is even and dust-free — the greatest possible protection against the common cold. You get another dividend in basement room — plenty of new play space for the whole family. You get a third dividend in an easier-to-keep home and lower cleaning costs. You get a still further return in a lower average cost for all gas used in your home.
A THIRD OF ALL GAS HEAT INSTALLATIONS ARE MADE IN THE SPRING
Let us give you a complete, free heating cost estimate, and explain the advantages of acting now!
THE BROOKLYN UNION GAS CO.

Typical 3 column 9½ inch Newspaper advertisement.

day a large proportion of the house heating sales originate with them.

Advertising Answers Questions

So that the consumers might know the advantages of gas heating, the company issued a series of broadsides 21½ by 13½ inches which were sent to all one and two family houses. The material in these messages was correlated in all media of advertising used by the company, such as billboard and newspaper advertising as well as direct mailing. The three types of advertising which accompany this statement show how this was done.

Results Justify Care in Planning

Six thousand heating installations have been added to the company's lines in two and one-half years. This remarkable performance is made even more impressive by the fact that only about one per cent of the total installations have been removed. This is our compensation for care in providing proper engineering and adequate sales training. But even with these, we could not have sold gas house heating if the customer had not wanted it. We have now a well-paid sales force which is increasingly competent in solving heating problems and highly confident and optimistic as to the future of the gas business.

Summing up, three points invite special attention. In the first place general salesmen and plumber-dealers were educated to sell house heating. Secondly, the success of this method is attested by the amazingly low number of removals (about 1%). Finally, and as a result, gas house heating is being sold in fair volume on a sound, self supporting basis without adding to new business expense.

BEFORE YOU ORDER FUEL — *Return This Card!*

THE BROOKLYN UNION GAS COMPANY:

I should like the latest facts about gas house heating, and I should like to know the actual cost of gas heating in homes similar to mine.

Name .....

Address .....

.....

This card requires no stamp. Simply fill in and mail. Our representative will call and present the facts, but you will not be obligated or subjected to annoying sales pressure. We are eager for every customer to have the essential information about gas heating, even though he is not now in a position to say "Go ahead!"

Return Post Card Used with Broadside

House Heating in St. Louis County

Sales Conducted on a Teamwork Principle

by

W. L. Jones

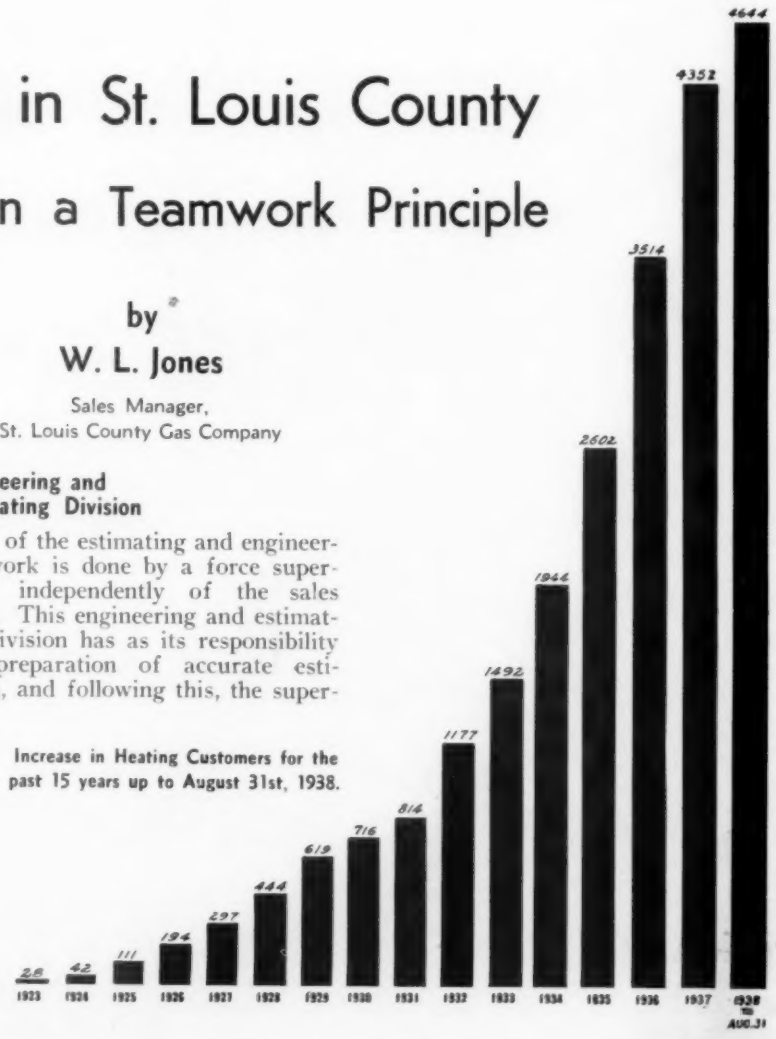
Sales Manager,
St. Louis County Gas Company

IN St. Louis County the sale of house heating as a continuous specialized activity started about 1925, at which time the company sold no heating equipment but had an extensive plan of dealer cooperation. With the advent of the conversion burner the company found it necessary to sell conversion burners, in order to get proper acceptance of them; but in setting up the program, full consideration was given to securing the cooperation of dealers who sold conversion burners, and the program of selling no gas designed equipment was continued. In 1932 the company changed from a manufactured gas to mixed gas, and following this the house heating sales division was expanded and the advertising and sales promotion increased.

This outline of the development of the house heating sales division is given because the fundamental policies underlying the house heating sales work have, for the most part, remained unaltered throughout these years.

Engineering and Estimating Division

All of the estimating and engineering work is done by a force supervised independently of the sales force. This engineering and estimating division has as its responsibility the preparation of accurate estimates, and following this, the super-



Increase in Heating Customers for the past 15 years up to August 31st, 1938.

For Cleanliness
For Dependability
For Certainty
For Comfort
For Freedom
HEAT with GAS
TODAY—it really costs no more to
HEAT with GAS
Mail This Card Today for a Free Survey
Gentlemen:
I have been interested in reading your literature on GAS HOUSE HEATING.
Since it does not obligate me, you may have your representative call and give me complete details.
Name
Street
City
Telephone Number
Best time to call
Day of the week
WITH WINTER OVER and its worries behind you, this is the time to look ahead and secure yourself against a repetition. Modernize your heating system with gas so it can function alone. Enjoy what you have probably wished for hundreds of times: Carefree, dirtfree heat! That's what you get with Gas! It is truly and completely automatic. Lets you forget the furnace and take Winter easy . . . as well as all those keep-you-guessing days when much or little heat is needed. Heat is one thing you don't have to think about. It is always there when you want it . . . no matter how icy the streets, or how deep the snow! Nothing to order! Nothing to bother about! Talk to your neighbor who heats with gas. He will tell you that he wonders how he got along without it and that it is the last thing he would give up.
More and More People in St. Louis County are Changing to Gas Heat! It's Modern! It's Clean!
Enjoy Summer More by Improving Your Home Now with Modern Heat
THE ST. LOUIS COUNTY GAS COMPANY
231 WEST LOCKWOOD AVENUE . . . WEBSTER GROVES, MO. . . . REpublic 4581

Inside spread of 4 color broadside 17 x 11 inches for Spring Campaign. Mailed to prospects with prepaid return post card enclosed.

vision of installations so that heating costs will be held to a minimum. All estimates made by this division are turned over to the sales department, and it is the sales department's responsibility to close all sales on the basis of the estimate furnished. Careful consideration has been given to all quotations. Throughout the years we have had the office confirm all quotations by mail, after the salesman has presented his story, in order to eliminate any possibility of misunderstandings.

Dealers have been an important ally in this work. Since the inception of the program a financing plan has been available whereby heating equipment sold by dealers could be financed on the gas bill. Since the company sells conversion burners but does not sell gas designed equipment, bonuses have been paid to salesmen to offset the burner commission so that the installation of gas designed equipment results in an increase in a salesman's earnings rather than a decrease. Salesmen are paid on a salary and commission basis, one sales group handling all "new house" business and a separate group handling the "old house."

Teamwork in Sales

In the new house field, builders, architects, heating contractors, and others frequently like to handle their business through one particular salesman. Since it is not always possible for the same group of architects, builders and contractors to be interested together in every house, this did, for a time, result in some confusion among the new house salesmen. To remedy this situation, this force of salesmen has been put on a team basis; and while a commission plan of compensation has been retained, the commission is earned by the team rather than by each individual. Under this set up, in order to secure house heating in a new home, it is possible for a different salesman to see each of the interested parties. The failure of any one to handle his part of the transaction properly may mean the loss of the order, and this has resulted in excellent cooperation among the salesmen in this group.

While we have done and still do a considerable amount of direct mail and other advertising, this can never serve as a substitute for active sales work. Success in this field lies in the efforts of the salesmen who, after all, must close every sale.

This year we publicize "Gas for the Four Big Jobs" to get across this idea on the shoulders of the acceptance which had been developed in previous years for gas heating. Although the saturation on gas heating does not approach the saturation on cooking or water heating, it is a fact in this territory that the modernity of gas heating occupies first place in the minds of our customers. We feel that gas house heating can be used to help build acceptance for other uses of gas. For this reason most of our advertising this year featured the "four big jobs" rather than house heating alone.

Salesmen for House Heating Exclusively

There seem to be many logical reasons why a house heating salesman, while specializing on heating, should be able to sell a considerable volume of domestic appliances. However, efforts to encourage the sale of appliances by these salesmen have subtracted from their house heating enthusiasm with the result that they now work on house heating exclu-

An example of the Billboard use of "Gas for the 4 Big Jobs."

sively. It is our belief that with proper cooperation between the appliance sales division and the heating division, best results can be obtained by complete specialization.

That the underlying plan for the sale of house heating has remained reasonably constant for many years does not mean that the sales force has been dormant. It is not necessary to announce some radical change in policy in order to stimulate the interest of the sales force. Contests, advertising, lead getting activities, and various other programs which may run from one to three months have been carried on throughout this period. Sales results are shown by the following table:

1925	69	1932	363
1926	83	1933	315
1927	103	1934	452
1928	147	1935	658
1929	175	1936	912
1930	97	1937	838
1931	98	1938 (first 8 months)	302

At the present time the company has 4,644 customers who are either using gas heating service or have contracted to install it, out of a total of 45,328 total residential meters.

20% Saturation in Gas House Heating Achieved in Denver

Air Conditioning Rapidly Increasing. 80% of New Houses Designed for Gas Heat

by
Roy G. Munroe
Public Service Company of Colorado

THE city of Denver has a population of about 308,000 with approximately 60,500 homes.

The Domestic Gas Sales Division is operated under the direction of a Sales Superintendent who is assisted by four supervisors, each of whom has ten territorial representatives. Thus each man has a territory consisting of approximately 1500 customers. This number enables him to contact each customer about twice a year, which is felt to be good economics.

The Domestic Gas Sales Division is staffed with four very competent housekeeping and air conditioning engineers. All prospects are secured by the territorial representative. The individual job is then surveyed, laid out, equipment specified, operating costs estimated and these completed details determined by this engineering staff. With this definite information at hand the territory representative is in a position to re-contact his prospect with definite and dependable data. In fact no sales are consummated without this procedure. Thus all guessing is eliminated and later dissatisfaction avoided.

The department as a whole is maintained year in and year out, thus enabling the company to build and hold an organization of very competent and dependable personnel. There are no irregular spurts of sales activities but there is a constant, year-around, intensive sales campaign.

The compensation schedule yields a total amount that will attract and retain desirable sales people. The salaries or drawing accounts are planned to care for basic needs, while the larger part of this total is paid on a percentage schedule together with special bonuses on load building units and special prizes from time to time to inspire additional effort.

Very little direct mail is used; however a good local advertising appropriation is provided at all times. This

SUNSHINE or SNOW . . .
Makes NO Difference
-in the evenly regulated warmth and comfort of the
GAS HEATED HOME
PUBLIC SERVICE COMPANY of COLORADO

Summer and Winter and the appeal for the health and happiness of the child are the outstanding notes in this effective newspaper copy. Actual size 8½ x 7½ in.

Let Us Measure Your Home
. . . for an ACCURATE estimate of the cost of heating with Natural Gas
THEIR many years of experience have made it possible for our heating engineers to tell almost to the dollar what it will cost to heat your home with natural gas.
You may be surprised, as have so many others, to discover how reasonable the cost of gas heat really is, and how much you get for your money —not only in heat, but in UNIFORMITY of heat, in CLEANLINESS, in HEALTH PROTECTION, and in FREEDOM from work, worry and drudgery.
Why let "guesses" about the cost of gas heat keep you from enjoying its many advantages, when you can have your home measured and gas heating costs ACCURATELY determined without cost or obligation to you?
'Phone Today for this Service!
Public Service Company of Colorado
On September 15
strike a match
light the Gas Flame
. . . And Forget
ALL ABOUT YOUR FURNACE!
Low-cost Automatic Gas Heat, regulated by the wall thermostat, will maintain a uniform, healthful temperature in your home until the warm days of May
No heating worries, even when the mercury plunges down without warning. No furnace work in the cold hours of the early morning. No furnace regulating to interrupt your evening's comfort. Just uniform, comfortable WARMTH, day in and day out, that you can accept and forget about.
Will this be true in YOUR home this winter?
MAKE IT TRUE by 'phoning NOW for information on converting your present furnace to burn gas. No obligation.
Public Service Company of Colorado

These newspaper advertisements each 3 column, 10½" high are part of the series that have strong appeal to men. On the left a moderate price home is shown as an average prospect and it bears down on the accuracy of estimate for gas heating. On the right the appeal to man's comfort throughout the heating season is well illustrated and the convenience of gas heat clearly set forth.

consists of newspaper, radio billboards, etc. Window displays are under the direction of an artist who changes them frequently and with the best seasonal effects.

Dealer Cooperation

All equipment carries special discounts to dealers which make their net costs as low as can possibly be maintained. They are assisted in every possible manner and means without subsidies of any kind.

Past performance and high class servicing has built up sufficient customer confidence and public acceptance that now 80% of the new homes being built in Denver are designed for gas heat. A large proportion of the installations are being made by outside dealers.

Gas Hospitality House*

This department consists of an auditorium with seating capacity for 100 persons and the stage is a lovely, modern, all-gas kitchen. The stage curtain is flanked by two automatic gas storage water heaters which are spot-lighted. The room is beautifully decorated in modern manner, properly lighted and uses comfortable white leather chairs. It is air conditioned and the air conditioning equipment is prominently displayed in a den or "game room" setting. A director is in charge of this activity and is assisted by an expert home economist and others are required. Demonstration programs are presented to the public five days a week, two days of which the program is also broadcast over the radio. All programs are based primarily on selling the idea of gas and the desire to possess this modern, luxurious form of living. Competitive equipment is demonstrated as well as that sold by the company and the institution has become quite a forum for the housewives of the community.

Results

In addition to very happy public relations, the company has been able to attain results which are outstanding. The department is operated along sound merchandising lines, extremely considerate of its customers and very fair to its competitors. These results may well be summed up in the statement that Denver now has a saturation of 43.5% in storage water heaters and 20% in househeating. Fully 75% of the latter jobs now sold are complete gas designed. Also, much progress has been made in the selling of completely gas heated, air conditioned installations. Over 150 homes enjoy automatically controlled humidified air washing and filtering together with well circulated heat, and this amount is rapidly climbing.

* *See article* American Gas Journal, *Sept.* 1936, *page* 26.—*New Attractive Auditorium Promotes Appliance Sales.*

TITAN WATER HEATER CONTROLS

AGA Approved TITAN Temperature and Pressure Relief Valve

This device is installed on the hot water outlet in the tank directly in the flow of water. Action, as a result, is unfailing and positive, there being no dead pockets to prevent proper functioning of relief valve.

Pressure relief is obtained through a spring-loaded valve which opens when the pressure reaches a predetermined point. Should the water become overheated to 200° F, a fusible disc melts and lets the water escape thereby preventing a further increase in temperature.

The Titan Relief Valve serves as a coupling connected in the line thereby eliminating the necessity and expense of a tee fitting. To replace fusible disc, it is not necessary to disassemble valves or piping in any way.

Designed for application to storage or range boilers. Prevents corrosion, scalding and explosion.

Catalog and full information upon request.

The Titan Valve & Manufacturing Company

Thermostats • Safety Pilots • Relief Valves • Safetystats
9913 Elk Avenue Cleveland, Ohio

All sizes up to 3,400 cu. ft. capacity

Meters
Diaphragms
Repairs
Provers
Pumps
Calorimeters
Wet Meters
Gauges
Apparatus

METER REPAIR PARTS

FOR

ALL MAKES — ALL SIZES OF METERS

LARGEST GAS COMPANIES NOW USING OUR PARTS

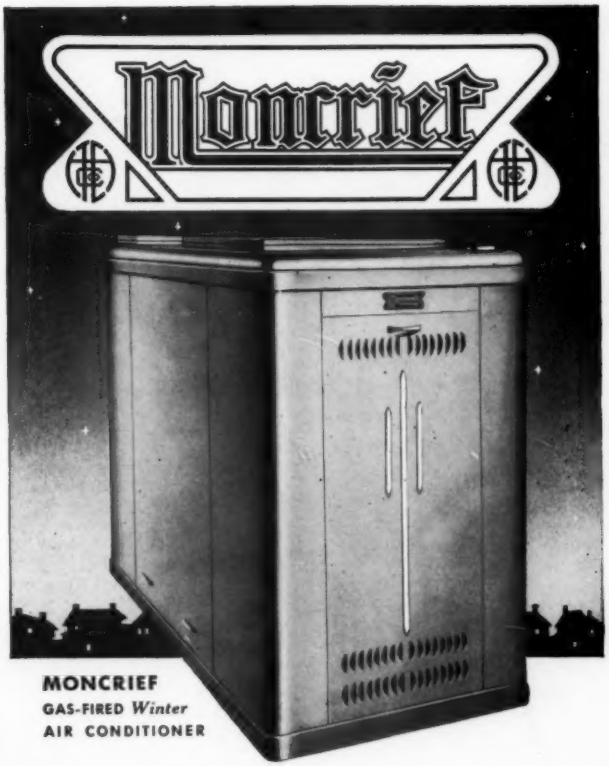
SEND FOR OUR CIRCULAR ON METER REPAIR PARTS

SAMPLES AND PRICES GLADLY SENT

— 0 —

LAMBERT METER CO.

BUSH TERM. BLDG. 4, BROOKLYN, N. Y.



MONCRIEF
GAS-FIRED *Winter*
AIR CONDITIONER

MONCRIEF Gas-Fired Winter AIR CONDITIONERS

Two types give gas companies units with which to fill demands in any price range. The cabinets of both are newly designed and most attractively finished. Both include the specially designed Moncrief heating drums of extra large radiating surfaces with relation to gas input and extra long horizontal gas travel, producing amazingly high efficiency with low gas consumption; made of heavy cast iron—rust and corrosion proof.

In thousands of homes, Moncrief Gas-Fired Winter Air Conditioners are making gas a practical fuel because of their exceptional economy of operation. Approved by A. G. A. Moderately priced to give big value.

Write for new literature.

MONCRIEF
Series "GG"
Gravity
Gas Furnaces

Efficient, economical and moderately priced; most advanced in design and construction. Beautifully finished cabinet. Same burners and heating sections as Moncrief Gas Winter Air Conditioners.

The Henry Furnace & Foundry Co.

3484 E. 49th St., Cleveland Ohio

a story of success

(TO BE CONTINUED)

When home-owners and home-builders throughout the land show a keen interest in the modern use of gas, it means the national advertising of A.G.A. is working! So "Gas Marches On" in 1938-39, backed by more than 700 gas companies which are continuing their participation in a program designed to promote the use of "Gas for the 4 big jobs."

It's a convincing sign of success when 2½ million customers call in person at their local gas company offices to ask for a booklet on gas cookery. That's how listeners have responded to the Mystery Chef Radio Program.

Big news of the year in the gas industry is the sensational new CP range—now being announced in millions of advertising messages and editorial pages.

With these activities already in full swing, the gas industry is in a strategic position to take advantage of the expected business improvement. So when A. G. A.'s plans for the new campaign were being laid, we eagerly said, "Count us in for 1938-39!"

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

AND AFFILIATED COMPANIES

ELECTRIC, GAS, AND STEAM SERVICE FOR BUSINESS AND THE HOME

Two House Heating Sales Groups Active in Westchester County, N. Y.

by
H. G. Schaul
Manager House Heating Division
Westchester Lighting Co.

"THEY SAID GAS HEAT IS NOT EXPENSIVE— I SAID, SHOW ME
..and By Gosh They Did!"
ASK FOR A FREE SURVEY OF YOUR HOME NOW!
"Take my word for it, Westchester Lighting Company leaves nothing to guesswork when they make an estimate of heating by gas. They sent a representative to look over my house, and you should have seen that fellow go to town!
"First he checked up on our furnace and radiators and measured all the rooms. He measured all the windows and doors and jotted down some notes on weather-stripping insulation and other details of construction. He also studied our exposed wall surfaces and asked how warm we like to keep the house in winter. A real thorough job!
"I had the surprise of my life when I was informed, a couple of days later, how little it would cost to switch to automatic gas heat! But I knew the estimate was right! They've done it so many times, they can figure the cost with uncanny accuracy.
"Yes sir! I sure am glad I sent in that coupon to find out whether or not I could afford the comfort of gas heat! And I'm telling all my neighbors to hurry up while there's still an opportunity to purchase gas house heating equipment at the lowest price ever offered here in Westchester."
NOW IS THE TIME—while the furnace is shut down—to have an AUTOMATIC GAS CONVERSION BURNER installed in your present furnace.
Prove it to Yourself!
$179.50
SEND COUPON FOR FREE SURVEY AND ESTIMATE!
NO OBLIGATION
THIS OFFER IS FOR A LIMITED TIME ONLY!
WESTCHESTER LIGHTING COMPANY

5 Column 14½" Newspaper Advertisement. One of a series used in Westchester Campaign.

THE Westchester Lighting Company employs two specialized groups of salesmen who devote their entire time to the sale of gas house heating. One group of eight contacts the existing home for replacement business, and the other group of three, the newly constructed homes.

Due to the rapid growth of new house construction, it was deemed advisable to segregate the activities of the two groups. By reason of this policy much of the success in securing new house construction to gas heating has been brought about by careful association with architects and builders. The men who are handling the replacement business in existing homes are, in the main, college graduates, and have accumulated a good heating background so as to be thoroughly conversant with the various heating problems encountered in the field.

Gas conversion burners this year have been reduced to the lowest price in the history of the Company, namely, $179.50. The price includes the complete installation of a standard conversion burner together with an electric clock thermostat. With the large amount of new building construction work going on in the country, there is a trend toward the manufacturer selling to the builder direct both house heating and water heating equipment.

Direct mail advertising has been used to great advantage by concentrating the mailing pieces on a selected list of coal and oil users. Since the county is divided into a number of district offices, the advertising copy has been sent out effectively with a personal letter to the customer from the local district manager.

Local newspaper advertising throughout the county ties in the various heating campaigns. Window and floor displays in the various dis-

The Westchester Lighting Company at "Home Show" in County Center effectively displays the gas appliances which serve the home. House heating holds the center of the stage.

Home Shows, Model Homes, Window Displays, Newspaper Advertising, Truck Posters and Direct Mail, together with an aggressive and well trained sales force resulted in the sale of 744 installations of gas heating equipment in old and new houses in a period of 8 months.

trict offices are utilized to bring out the features of the househeating campaigns.

With a large number of trucks continually operating throughout the county, truck posters have been an effective means of advertising the various heating campaigns.

Due to the amount of house construction, many local builders and organizations installed gas heating equipment in their model houses. This means of advertising was most effective in bringing to the minds of potential buyers and visitors the public acceptance of gas heating. Company booth displaying heating equipment have been used in the various home shows held throughout the county.

Dealers are encouraged in the direct sale of gas heating equipment.

From January 1st to August 31st, 1938 inclusive, 744 installations of equipment for gas heating have been made, covering both old and new homes.

Low Cost Model Gas Heated Home in New Rochelle. Heating equipment is a Dunham Vapor system gas-fired boiler. Has A. G. P. gas water heating unit with 30 gal. copper boiler and also a gas range.

White Plains, N. Y., Gets 77 New Gas Heated Homes

The rising tide of four-way gas service in modern homes is well exemplified in the new Westminster Ridge development in White Plains, New York, where seventy-seven completely gas-equipped low-cost homes are planned. About half of these houses are already completed.

The Westminster Ridge tract is being developed by County Homes Corporation, of which Mr. Lee Perry is president and architect. Acclaimed

When this Westchester, N. Y., private lake freezes over, these youngsters take off their skates and return to gas heated homes, to dinners of gas cooked meals with food kept fresh in gas refrigerators; and so to bed after a gas heated bath.

by many authorities in the building field as the most noteworthy low-cost housing project of the year, this development incorporates most of the advanced ideas in real estate now in use.

Westminster Ridge is strictly a planned community, of the type which caused so much favorable comment in the American Gas Association's recent architectural competition. A small lake and playground are included in the tract. Streets are broad, and laid out in sweeping curves adapted to the terrain, rather than in square blocks, thus making for far more attractive vistas, and breaking the monotony of the typical development of even a few years ago.

Each home is specially designed for the site it occupies, and every lot is landscaped, taking full advantage of the location to create a home of charm and distinction without the necessity for an expensive or pretentious house. The variety and charm achieved in this manner is remarkable, and can only be appreciated fully by seeing the project.

"The Lincoln"—Six room, bath and lavatory, model home in the $8,500 class, White Plains, one of two complete all-gas homes selected by the American Gas Association in its national better-housing campaign. Lee Perry, Architect.

Of particular interest to utility men is the strong tie-up with gas in Mr. Perry's promotional scheme. Each home is equipped with an automatic gas water heater and gas fired house heating unit included in the purchase price of the home.

Facilities are available for the immediate installation of a gas range and gas refrigerator. Cooperating with the American Gas Association's Home Appliance Planning Bureau, a large prominently placed sign proclaims the fact that the houses are American Gas Association All-Gas Homes. In keeping with the Association's demonstration program, two of the Westminster Ridge houses were opened for demonstration during the period of September 15-29. Specially prepared literature placed in these houses, described the advantages of this type of home equipment. Included in this literature, a statement by Mr. Perry reads:

"After having been a firm believer in the use of gas for domestic purposes for the past fifteen years in larger homes, I was firmly convinced that its use in low-cost housing would be equally as successful. In planning and developing Westminster Ridge, I insisted upon gas being used for heating, domestic hot water, refrigeration and cooking, for I felt sure that the home buyers would find gas to be the most satisfactory and economical solution for comfortable living, not only because of its flexibility, but also for its cleanliness. The success of our development is testimony of our judgment in having selected gas for this purpose."

One of the most significant facts for gas men is that complete four-way gas equipment invades the low-cost field in such an impressive extent in the Westminster Ridge development. While the houses are winter air conditioned, insulated, and have garages and full size cellars, prices start at $5,800,00, with terms of $48.00 monthly, this amount paying all expenses, including the mortgage.

PRIZE-WINNING
A·G·A
All-Gas Home
Working areas are compact and convenient . . . Unique advantages of GAS fuel permit concentration of equipment.
ALL housekeeping facilities are closely coordinated. The architect has capitalized on the cleanliness of gas, and the striking, space-saving designs of the new gas appliances.
This centralization not only provides for convenient operation, but also assures economical construction. Elaborate flue and chimney work is avoided. Expensive basement excavation is saved, because no fuel storage space is required.
And operating costs in the house where gas does the 4 big jobs are lowest in history! Gas is more economical than ever. Gas equipment is more efficient than ever.
All-gas homes are easier-to-build, easier-to-sell, easier-to-keep. Consult with your local Gas Company technicians for full information and detailed specifications of the new gas ranges, refrigerators, and water and house heating equipment.
Architect:
JOSEPH SHILOWITZ
26 Journal Square Building,
Jersey City, N. J.
A. Compressor
B. Gas water-heater
C. Gas-operated air-conditioner
D. Gas refrigerator
E. Gas range
F. Gas laundry dryer
LET Gas DO THE 4 BIG JOBS
COOKING
WATER HEATING
REFRIGERATION
HOUSE HEATING
How build an A·G·A All-Gas Home . . . enter the $10,000 prize competition for builders and their architects.
The All-Gas Home Building Competition closes July 1, 1939. Write for entry blank and free booklet, containing all the information you need. Competition Director, American Gas Association, 420 Lexington Avenue, New York City.

As part of the A.G.A. prize competition campaign, this full page advertisement (7 x 10) appeared in American Builder.

Now they can do this

Out for the day — while the range works away,
Making perfect cookery easy as play

BECAUSE every factor in the gas industry has looked forward, worked forward, moved forward steadily. The utility companies have brought gas to more and more millions of homes. The range manufacturers have transformed their product, added immeasurably to its appearance and its efficiency. The equipment manufacturers have given their enthusiastic support, supplied mechanical innovations which made rapid progress possible. »» Robertshaw is proud to have had a share in this great promotional movement, to have actively promoted not just heat control but the modern range which it helped to create. The future will bring new opportunities to us all, and Robertshaw will continue to help the industry make the most of them.

We cordially invite you to drop in on us at the AGA convention

ROBERTSHAW
THERMOSTAT COMPANY
YOUNGWOOD · PENN

CP Range Activities

Heartily Endorsed East and West

The new CP Range is being promoted by striking display advertisements by many gas companies in their local papers. This is well illustrated in the reproduction of an advertisement of the Nashville Gas and Heating Co. occupying about two-thirds of a page in The Nashville Banner.

The Seattle Gas Co., Seattle, Wash., tying-in locally with the American Gas Association's national advertising campaign on CP Ranges, built up considerable interest before the breaking of the campaign with teasers both in the newspapers and on spot radio announcements. Teasers used the letters "CP," as, "CP—Does it mean Czar Peter? Does it mean Calorific Pulchritude? Does it mean Cooking Perfection? Does it mean Crossword Puzzles? Does it mean Christmas Presents?" Follow-through advertisements then announced that "CP" means "Certified Performance," and aggressively merchandised the 22 features of the new ranges.

Norman R. McKee, retiring President of the Pacific Coast Gas Assn., in his address at the annual meeting of the Association Sept. 14-16 stated:

"The Certified Performance Range is probably the greatest promotional idea since the clock control and gas refrigerator were introduced. But the CP Range will mean even more to the gas customers, for it will serve as a guarantee of the finest available cooking equipment for the best of cooking fuels, embodying as it does in one appliance the twenty-two mandatory performance requirements designed to provide the customer with utmost in convenience, efficiency, flexibility and speed. The cooperative efforts on the part of gas companies, manufacturers and the A.G.A. Laboratories to promote the CP Range Program, will produce lasting benefit to the gas appliance industry."

The Home Service Dept. of gas companies is also doing a fine educational work in connection with the CP Range. In a paper presented at the Colorado-Wyoming CP Range meeting held at Denver, Colo., Mrs.

146 Years of Expert Cooking Experience
View the New CP Gas Range
EACH OF THE 22 SUPERIOR POINTS ACTUALLY TESTED AND CHECKED BY 5 FAMOUS NASHVILLE HOTEL CHEFS!
WE BELIEVE THIS NEW C-P RANGE TO BE THE Finest Cooking Appliance EVER DEVELOPED AND HAVE HAD NO TROUBLE CONVINCING THOSE WHO HAVE VIEWED THIS NEW RANGE
Nashville Gas & Heating Co.
BY
The above are but few of the fine points of the new C P Gas Range and we invite your inspection of this, finest of all cooking appliances. A liberal allowance will be made for your old cooking equipment regardless of age or type, and surprisingly low terms for the convenience of payments.
NASHVILLE GAS and HEATING CO.
On Sixth Avenue

Six Column, ¾ Page Newspaper Advertisement—One of a Series Used by this Company.

Here are two striking window displays created by the advertising department of Consolidated Edison Company of New York. The "22 Ways Better" disc promotes curiosity. "Hot Water Everytime" in the automatic gas water heater window is displayed in a novel and effective manner. And the trade-in allowance offer is distinctly a magnet. Raymond M. Martin is art director for these displays.

Vera Carter Ault, Home Service Director of Gas Hospitality House, Public Service Co., Denver, made the following pertinent statement.

"Because the homemaker has repeatedly been such a gullible victim of extravagant claims for all kinds of merchandise, she eagerly seeks protection in a truthful buying guide. Consequently, the rigid requirements and specifications embraced by the CP seal will be most welcome as a standard of dependable operation, and it is reasonable to predict that within a short time the CP seal will become a minimum, rather than a maximum standard for purchase.

"Heretofore, ovens that would really maintain flexible temperatures from high to low (225 deg.-250 deg.) have been mythical. Consequently, assured oven efficiency with a minimum heat requirement really signifies a cooking transformation, and the dawn of a new cooking day.

"Ovens are no longer wanted as just a place in which to bake, but as one of our customers expressed it not long ago, 'we want a fool-proof space in which we can cook whole meals from soup to dessert'."

Hugh H. Cuthrell, Vice President of The Brooklyn Union Gas Company, congratulates the first ten members of the Brooklyn Union sales force to sell five CP ranges each. These pace setters sold a total of 103 CP ranges during the six introductory weeks in Brooklyn Union's CP campaign. Left to right are Maude Echard, Frances Smith, Americo Gambo, Marianne Billies, Henry Engel, Alice Harrigan, Charles Kreth, Bessie Beards, George Heiderich, Anna Tietjen, Mr. Cuthrell and James J. Deely, retail sales manager of the company. In addition to praising them for their CP work Mr. Cuthrell was host to these CP sellers at a dinner party.

GLOVER-WEST VERTICAL RETORTS

The logical plant where maximum gas-yield and coke of high reactivity are required. The high thermal efficiency, low operating cost, extreme flexibility to meet variations in daily output, and freedom from naphthalene in finished gas have made this process the choice of experienced operators all over the world.

•

We place at your disposal the experience gained in over 400 installations now operating in all countries of the world and under widely varying conditions, augmented by the resources of modern research and a worldwide organization.

•

The proven reliability of Glover-West continuous verticals makes their adoption well worthy of consideration in any scheme of planning for the future.

•

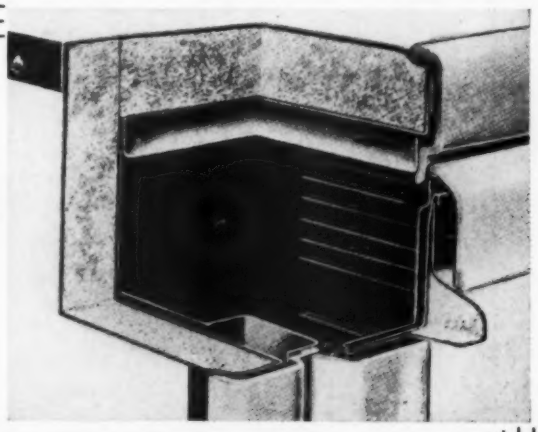
WEST GAS IMPROVEMENT COMPANY
424 Madison Avenue, New York City

THERMINSUL

The Ideal Insulation for Gas Ranges

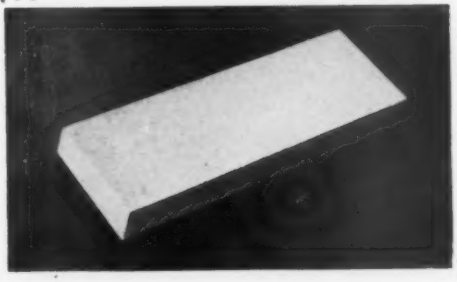
Felted Rock Wool Block is recognized as the most efficient permanent form of quality insulation obtainable.

Therminsul is manufactured to the exact specifications of every gas range. Each panel is cut to size to completely fill each lining—the thickness is guaranteed to be uniform and gives the maximum of insulating efficiency. It will not settle, break down, or disintegrate, but is permanent and lasting.



Every Block of Therminsul is cut to exact dimension and fits snugly into place. No joint leakage.

Therminsul has been used by the majority of leading range manufacturers for the past nine years and since its introduction over 19,000,000 square feet of oven linings have been insulated with this quality product.



THERMINSUL
PERMANENT INSULATION

THE THERMINSUL CORPORATION
1603 Fulford Street, Kalamazoo, Mich.

NATURAL GAS

... the Fuel with Uses as Varied as the Demands of Home and Industry

In response to the diverse needs of our modern civilization, this perfect fuel finds an ever-widening sphere of usefulness.

Thoroughly dependable and economical, Natural Gas provides a ready service . . . in *the home* for cooking, heating, refrigeration; in *industry* for manufacturing, refining, conditioning and research.

Annual consumption, reaching a total of some two and one-half trillion cubic feet, is true evidence of its versatility and value.

COLUMBIA SYSTEM

COLUMBIA GAS & ELECTRIC CORPORATION

Pacific Coast Gas Association

Large Attendance and Enthusiasm Marks 45th Annual Convention at Santa Barbara

The Forty-Fifth Annual Convention of the Pacific Coast Gas Association, held in Santa Barbara, California, September 14 to 16, was one of the largest gas conventions ever held on the Pacific Coast, the registration totaling 670 persons.

Practically all gas companies in the Pacific Coast states were represented. The American Gas Association was represented by its President, Mr. N. C. McGowen; R. M. Conner, Director of the Laboratories; E. H. Poe, Secretary of the Natural Gas Department; and F. O. Suffron, Supervisor of the Los Angeles Laboratory. Several gas companies in the middle west and southwest had one or more representatives present, as did practically all equipment and appliance manufacturers doing business on the Pacific Coast. At the banquet which closed the Convention 559 people were served.

The Officers and Directors elected were as follows: President, H. L. Farrar, President, Coast Counties Gas & Electric Co.; Vice-President, A. E. Holloway, Vice-President in Charge of Sales, San Diego Consolidated Gas and Electric Company; Treasurer, D. G. Martin, General Auditor, Pacific Gas & Electric Company; Directors: R. E. Easton, President and General Manager, Santa Maria Gas Co.; R. G. Logue, Vice-President, Ward Heater Company; W. R. Smith, Continental Water Heater Co., Ltd.; J. J. Winn, Jr., Commercial Manager, Portland Gas & Coke Co.; R. A. Hornby, Vice-President, Pacific Lighting Corp. (to fill unexpired term of Addison B. Day, who resigned.)

H. L. FARRAR
President, Pacific Coast Gas Association

Manufacturers Section

The following were elected in this Section:—General Chairman, R. G. Logue, Ward Heater Co., Los Angeles; General Vice-chairman, W. R. Smith, Continental Water Heater Co., Los Angeles.

Direct Heating Division:—Chairman, J. S. Andrews, Andrews Heating Company, Los Angeles; Vice-chairman, R. E. Fraser, Fraser Furnace Company, Stockton, Calif.

Furnace Division:—Chairman, A. J. Hartfield, Pacific Gas Radiator Company, Huntington Park, Calif.; Vice-chairman, Don Fleming, Electrogas Division, Payne Furnace and Supply Company, Beverly Hills, Calif.

Range Division: — Chairman, George Hammer, Hammer-Bray Company, Oakland; Vice-chairman, R. J. Merritt, O'Keefe and Merritt, Los Angeles.

Water Heater Division:—Chairman, A. H. Sutton, Mission Water Heater Company, Los Angeles; Vice-chairman, B. A. Hinckley, General Water Heater Company, Los Angeles.

CLIFFORD JOHNSTONE
Managing Director, Pacific Coast Gas Association

Gas Air Conditioner Installed in Historic Cliff House

Interest in complete air conditioning in San Francisco has quickened considerably as a result of the notably successful treatment of the famous Cliff House, in which a year-round installation was made when that historic landmark was recently rehabilitated by the Whitney Brothers.

The Cliff House, first built in 1858 from lumber salvaged from a foundered ship, is once more drawing visitors and natives to its dining room, bar, and lounges, in the same numbers as when the "nobs" of earlier days drove out to it in carriages across miles of sand dunes. The restaurant is located high on a basalt cliff, and its three stories of broad windows look out upon three miles of sandy beach, the Golden Gate, Mt. Tamalpais, the famous Seal Rocks, and the broad expanse of the Pacific Ocean.

The G-E system installed consists of a unit assembly air conditioner, with a 10-hp. condensing unit, and a large-type automatic gas furnace. It cools and heats, dehumidifies, purifies, and circulates air through the various rooms at the rate of 6000 cubic feet per minute. Both heating and cooling are thermostatically controlled. The system was installed by William P. Goss Inc., of San Francisco.

Experience With Installment Financing

by

J. W. Vanier

Office Engineer
Southern California Gas Company

THERE is nothing new about the installment financing business. It has been growing for years, until today it comprises 14% of the nation's total retail trade. In fact, three out of every four household appliances sold during the past few years were financed on installment plans of one sort or another. But there is something relatively new in the development of this business in the utility field. The experiences of a utility engaged in the installment financing business might be of value to others in the industry who may find it expedient or necessary to engage in a similar activity.

The Inception of "Long Term" Financing in Southern California

Let us briefly review some of the circumstances that had a bearing on the formation and operation of an installment financing plan for Southern California gas appliance dealers. Market conditions had altered perceptably between the years 1930 and 1934. Families in Los Angeles County who were wholly or partially dependent upon charity had increased from a normal of only 3% to almost 40%. A depression severe enough to eliminate the buying power of such a large proportion of the population had also decreased the income of those who usually purchased for cash or on open account, creating a very vulnerable market for "easy payment" purchase plans. A few of the larger mercantile houses sold household appliances on nominal terms. The smaller gas appliance dealers had to shift for themselves at a time when credit was difficult to obtain. No one had anything to compare with the liberal financing plans being formulated for the distribution of electric appliances.

About this same time, our competitors were making much ado over the abundant supply of electricity that would soon be available from Boulder Dam, inferring that it could be plucked from the dam and placed in the kitchen, as a magician would pluck a rabbit from a hat, with little effort and at practically no cost. Faced with a surplus of power, both private and municipally owned electric utilities were launching financing programs in an endeavor to load their lines with major appliances. Two adjoining municipalities offered rental programs, a private utility made available to dealers a five year purchase plan, another went even to the extreme of extending terms to eight years with carrying charges at less than the prevailing interest rates on sound short term bonds. In addition, the Federal Government, through the Electrical Home and Farm Authority, was financing the sale of electrical appliances in the Tennessee Valley, and there was every possibility that they would soon be with us on the Pacific Coast.

"Assembling the credit information is elementary. The problem arises in evaluating this information in terms of Character, Capital and Capacity, and at the same time being able to use sound judgment and not be unduly influenced by a highly competitive situation."

With this background, you may more readily comprehend some of the problems that a gas company would face in operating an installment financing business that would be both self-supporting and of sufficient scope to meet the variety of existing conditions.

The so-called "Long Term" Financing Program for gas appliance dealers had its inception in a restricted area in the early part of 1934 and later, in March of 1935, was made available to all cooperating dealers throughout the territory. This plan embodied five year terms for the better grade gas ranges and water heaters and also gas refrigerators when sold in combination with one of the two aforementioned appliances. With the exception of refrigerators, appliance sales were financed without recourse; that is, the dealers were not obligated to repurchase defaulted contracts. In consideration of this release, a discount ranging from 1% to 4% was deducted to cover anticipated repossession losses. Refrigerator sales were financed on a partial recourse basis that provided for a sliding scale of charges in proportion to the purchaser's equity in the appliance.

You may wonder at this time why the entire program was not entrusted to an experienced financing agency. At the outset, no private agency offered a plan that we believed would provide sufficient reserves to cover our contingent liability and at the same time keep the rates to the public at a level that would not give our competitors a price advantage for similar quality appliances. To the consumer, carrying charges are part of the ultimate cost of merchandise. Of course, due to lack of experience with five year accounts, both the utility and the private financing companies could only theorize on the extent of the contingent liability. In the question of utility financing versus private financing, the utilities' lack of experience must be weighed against the contingent liability that accrues when the accounts are handled at the discretion of a private agency.

As many of you know, we now offer an alternative plan in cooperation with a prominent banking institution. Contracts handled by the Bank are limited to three year terms and the amount of contingent liability can be forecast with a fair degree of reliability. The proposal made by the Bank eliminated the aforementioned objections to the previous offers of outside agencies. This alternative plan was of material assistance in making the revisions that reduced the hazard of our financing program. It also provided another source of credit for dealers who might feel that the utility as a sole financing agency would be dictatorial in its policy of granting credit.

Operation of a Financing Business By A Utility

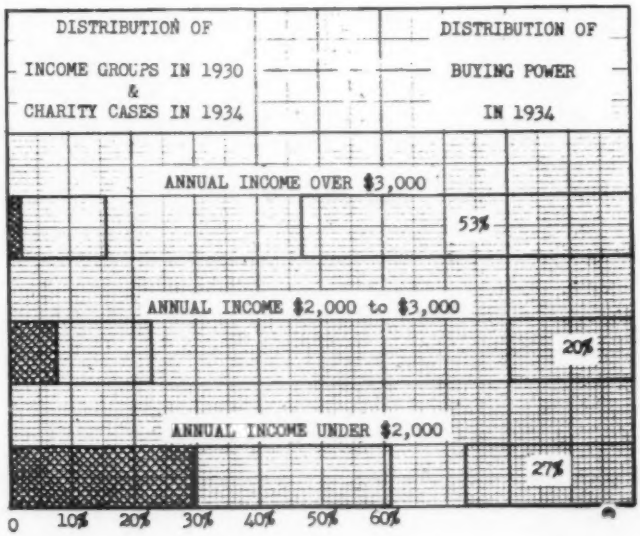
Fundamentally, credit and money both serve the same purpose. They were both devised as a medium of exchange to facilitate the distribution of goods produced. Whereas money represents accumulated wealth, credit may be backed by accumulated wealth, but the more com-

Paper presented at Annual Convention, Pacific Coast Gas Association, Santa Barbara, Calif. Sept. 15, 1938.

mon usage in the installment financing field is in the belief by the lender that the borrower has both the willingness and the ability to complete a contract. Credit was never intended to be used as a tool to originate a demand for goods, and when its use is so perverted, it will invariably lead to trouble in accentuating the booms and declines in sales volume.

I previously mentioned that after the collapse of the 1929 boom, charity cases in Los Angeles County increased from 3% to almost 40%. An analysis of the distribution of these cases illustrates sharply the necessity of exercising prudence in granting credit. I have prepared this chart (Figure #1) which is based on statistics compiled from a survey by the Los Angeles Times. The preponderance of cash and open account customers are in the higher income group. From the middle income group we obtain the cream of the installment financing market, nevertheless, one-third of this group had lost their purchasing power at the termination of the down swing in the business cycle. It is the lower income group comprising over 60% of the families that taxes the ingenuity of those entrusted with the responsibility of granting credit, and doubly so when the financing plan embodies small monthly payments that appeal to the lower strata of the group. It is too large a purchasing power to ignore. It is far too hazardous to exploit without discretion.

Figure I



This credit problem brings to mind a letter that was written by Abraham Lincoln when he was practicing as an attorney. Answering an inquiry from a New York firm regarding the credit standing of an individual, Lincoln wrote the following reply:

> "Yours of the 10th received. First of all he has a wife and baby; together they ought to be worth $500,000 to any man. Second, he has an office in which there is a table worth $1.50 and three chairs worth, say, $1.00. Last of all, there is in one corner a large rat hole, which will bear looking into."

The credit standing of quite a few of this lower income group will certainly "bear looking into."

When the program was first put into effect, we placed considerable reliance on the manner in which the purchaser paid his utility bills. This record alone, however, proved to be far from satisfactory. Those who pay their merchandise accounts promptly with very few exceptions pay their utility bills promptly, but the reverse is not always true. Likewise, a slow gas record is not always indicative of the manner in which a purchaser meets his other obligations. The gas record may serve in selecting the very good accounts or in weeding out very poor accounts, but it must be augmented with other information if the large number of border line cases are to be handled intelligently.

Value of Credit Records

The value of credit reporting agencies as a source of information varies considerably in different localities. The files of agencies maintained by merchants in the smaller communities usually contain the trade records of a representative proportion in all income groups. However, such is not the case in the metropolitan areas where the agencies have built up their files principally from the clientele of the larger department stores. Their records covering installment buyers from the lower income group have been very meager and the value of such records that they do possess lies principally in disclosing derogatory information. When file information is lacking, credit bureaus can supply a field report prepared by trained investigators, but to obtain such a report for each contract submitted is not only costly, but necessitates more delay than most purchasers will condone.

Mr. Buyer may take several months to arrive at a decision to purchase, but when his signature finally goes on the dotted line, he wants the appliance to be installed yesterday, if not sooner. To obtain that signature may have required considerable planning and sales effort and if costly cancellation orders are to be avoided, it is imperative that the credit information be accumulated as quickly as possible. By conducting the credit investigation with our own personnel, we have been able to provide, with few exceptions, 24 hour service at a very nominal cost. It has been our practice to check the purchaser's gas account, trade and bank references, verify the source and amount of income and ascertain the extent of other obligations. If the credit cannot be approved or rejected with the information so obtained, a report is purchased from the credit bureau. Often the lack of any derogatory information on file, plus the information already gathered, is sufficient data for making a decision; if not, a field report is obtained from the agency. We have found that field reports submitted by experienced investigators have contained more pertinent information than could be obtained from our own field men whose judgment may be biased because of their additional responsibility as collectors.

Capacity of Complete Contract

Assembling the credit information is elementary. The problem arises in evaluating this information in terms of Character, Capital and Capacity, and at the same time being able to use sound judgment and not be unduly influenced by a highly competitive situation. Character must be present at all times. Without the willingness, ability to pay means little. Capital becomes a factor in

open account transactions and short term installment sales to commercial institutions, but is usually negligible or lacking entirely when dealing with the lower income installment buyer. By Capacity we mean not only capacity to pay at the time of signing the contract, but probable capacity to pay at all times throughout the life of that contract. The willingness to pay or the desire to own the appliance must also be maintained until the contract is completed, and that is possible only when the down payment plus the monthly payments exceed the depreciation and at no time should the unpaid balance exceed the "use value" of that appliance to the purchaser.

increasing importance when evaluating Capacity.

Securing Mr. Buyer's signature to a contract and approving the credit are merely initial steps in placing modern gas appliances on the lines. The sale is completed and becomes a definite asset only when the final payment is received and this depends to a great extent on the proper functioning of the Collection Department. Undoubtedly, collection problems could be eliminated by the application of a severe credit policy that accepts only preferred risks, but it would be at the expense of nullifying the objectives—namely, the load building and protective features of a financing program. A more practical solution lies in the adoption of a modified credit policy and the establishment of a collection system that assures a prompt follow-up on delinquent accounts.

meter reading date, or by the customer moving to another locality. The purchaser naturally resisted any attempt to advance the payment date and became more delinquent with each successive change of due date —eventually destroying the importance of time as an essential part of the contract.

Replacing the routine monthly billing with a coupon book system eliminated entirely the billing expense on two-thirds of the accounts. We expected criticisms when making a revision that affected the paying habits of thousands of people, but were very agreeably surprised to find relatively few complaints and many favorable comments. Would that all the complainants had acted similar to that of a woman in Corona who had been habitually delinquent and never made a payment until the collector had made several calls. Upon receiving the coupon book, this party surged into the office, declared that she was not going to be our bookkeeper, and then proceeded to write a check which paid the account in full.

Figure 2

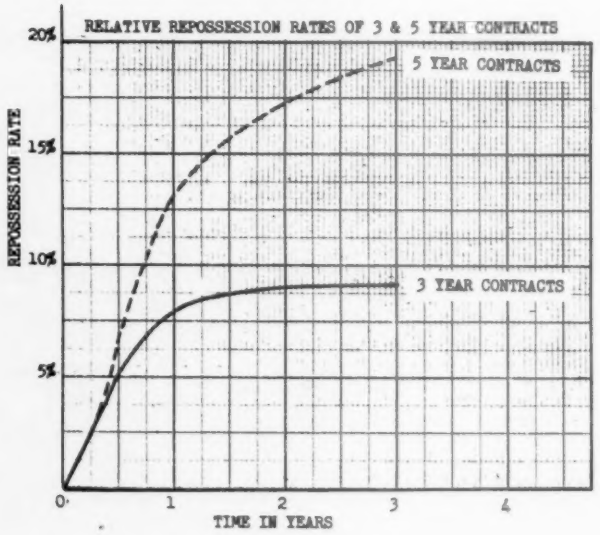
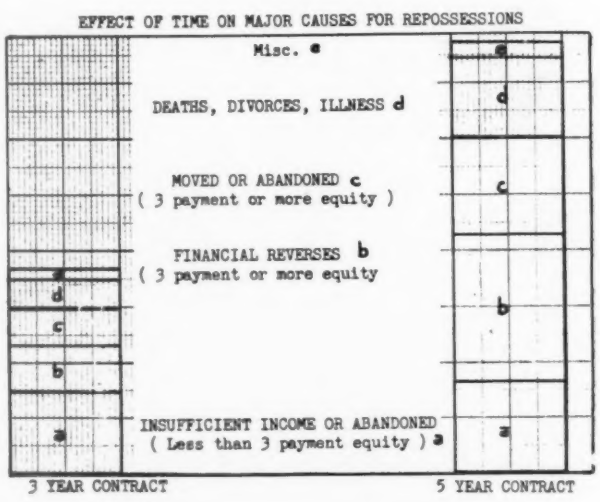


Figure 3


EFFECT OF TIME ON MAJOR CAUSES FOR REPOSSESSIONS
Misc. e
DEATHS, DIVORCES, ILLNESS d
MOVED OR ABANDONED c
(3 payment or more equity)
FINANCIAL REVERSES b
(3 payment or more equity
INSUFFICIENT INCOME OR ABANDONED
(Less than 3 payment equity) a
3 YEAR CONTRACT
5 YEAR CONTRACT

Repossessions

If capacity to pay is to be gauged accurately, the creditor must know how frequently repossessions occur and the reasons for them. Let us analyze (Figure #2) two groups of contracts covering similar appliances that have been at risk during both the rise and decline of a business cycle—one group covering contracts of 3 years duration, the other group written on 5 year terms. After a three year period, 9% of the 36 month contracts were ultimately repossessed, while in that same period of time over 19% of the 60 month contracts have already been repossessed and they are still at risk for an additional two years. When we look into the reasons (Figure #3) it is apparent that the creditor on long term contracts must be more or less of an actuary. As we lengthen the terms, relative position of the business cycle, and stability of income, rather than amount, assumes

The Coupon Book System

Until a few months ago, it had been our practice to issue a monthly bill—a procedure that was expensive in both postage and labor; labor that could be utilized to much better advantage when concentrated on the delinquent accounts. Part of this expense could have been eliminated by combining the merchandise and utility bills on one statement, but we wished to avoid any possibility whereby the consumer might unconsciously view the combined statement as a high cost for the utility service. Furthermore, in districts where the merchandise and gas accounts had been coordinated, an unsatisfactory condition emerged whenever the payment date was changed, either by reason of the company changing its

With the inauguration of the coupon book system, the accounts were carried in numerical order instead of alphabetical and segregated according to the date payments became due. This change materially decreased the time spent in sorting stubs, in posting cash, in allocating payments unaccompanied by statements, in recording changes of address promptly; all to the end that it facilitated the operation of a methodical plan for sending notices on the tenth, twentieth, and twenty-fifth day after an account became delinquent. These notices have been in-

strumental in collecting 85 to 90% of the ten day delinquencies before the next payment falls due.

Handling Delinquents

Accounts thirty days or more delinquent are placed in the hands of a field man who is assisted in his collection effort with telephone contacts and correspondence by the office personnel.

One of the greatest obstacles confronting a utility in the operation of a financing business is the tendency to treat merchandise and utility accounts in the same manner, or even more dangerous, to be extremely lenient with a merchandise account because of the competitive situation. A delinquent utility bill represents the amount of money shown on the statement for a service that does not depreciate with time. On the other hand, a delinquent merchandise account of a few dollars may represent an actual out of pocket investment of several hundred dollars on an appliance that is constantly depreciating and unless the customer's equity keeps pace with this depreciation, we will very probably own a repossessed appliance.

The merchandise collector's first line of duty is to obtain the payments and endeavor to keep the appliance on the lines. To find out *why* the payments are not being made will usually bring better results than to threaten. It may be some small matter that can be easily adjusted. Perhaps the dealer has not fulfilled his promise to replace a defective part or the customer may be dissatisfied over some trivial fault and should be resold on the value of the appliance. A knowledge of the family budget and its proper distribution will enable the collector to show *how* the payments can be made—or to arrive at a decision as to whether or not an extension is warranted and could be granted in accordance with a definitely pre-arranged basis. When the purchaser is not able to complete a contract, many repossessions are averted by the collector's assistance in assigning the original purchaser's equity to a second party.

Our collection policy now calls for definite action when an account becomes sixty days delinquent. If a customer's income has been reduced to a point where he is barely able to purchase the actual necessities of life, it is of little avail to accept a few partial payments and then ultimately repossess the appliance. When decisive action is necessary, it should be taken immediately. I recall the case of a negro who managed to purchase a range before the Credit Department was properly organized and had since been a thorn in the side of the Collection Department. The negro and the collector had both reached the conclusion that the account would never be fully paid, but they had decidedly different ideas as to what was going to be done about it. Every attempt to gain entrance to make a repossession was resisted and a payment would be made just in time to postpone legal action. In a final attempt to clean up this account, the regular collector and a special field man both called and after much bickering were told, "Ah jist gotta hab mah likker, en if you boys gib me two bits apiece, you kind hab dat stobe." Before he could change his mind, he had two quarters and the range was on a truck. That was one case where decisive action saved considerable legal expense.

When nothing further can be done by the regular collector, accounts are referred to the Legal Department, and if necessary, replevin action is started. Habitual dead-beats have become rather immune to mere threats of legal procedure, and it sometimes requires drastic action to make this type of person realize that the utility is operating a financing plan and not donating appliances to consume the fuel. This department also handles delinquent accounts of purchasers who have moved from the territory served by the Company. In the past, this moving problem has been a source of continual annoyance and it has only been through the close cooperation of other utilities that losses from "skips" have been kept at a minimum. Now that the alternate Bank plan is available, accounts can be readily handled if the purchaser moves into any district where this banking service prevails.

Effect of Revised System

You may judge the effectiveness of this collection system by comparing the amounts delinquent after a few months operation under the new procedure. In five months time, and in spite of a sharp business recession the amounts delinquent sixty days or less had decreased 27%. In this same period, the delinquent payments on critical accounts over sixty days past due had declined 57%.

Two and a half years experience as a financing company convinced us that an unbridled five year financing plan could very easily lead to heavy repossession losses, particularly with storm clouds brewing on the economic horizon. With 85% of the financed sales being written on the longest terms possible, it was evident that either the dealers were concentrating on the lowest income group or were making little or no effort to sell the appliances on more advantageous terms. To correct this situation, two very beneficial revisions were made in our financing plan:

(1) The dealer's "no recourse fee" on short term contracts was reduced while his responsibility on long term contracts was increased by the application of a recourse provision that made him responsible until three consecutive and punctual monthly payments had been received.

(2) The carrying charge structure was revised to provide lower rates on short term contracts and higher rates on long term contracts to cover the larger collection costs and necessary repossession reserves. By increasing the differential between the charge for financing a contract for 36 or less months and 37 or more months, the dealer has a potent argument to use for selling shorter terms.

Most dealers readily grasped the opportunity to sell appliances on a plan that assured increased profits. The few that still persisted in exploiting long terms were personally contacted and instructed in the advantages of selling merchandise instead of terms. Within a few months, the proportion of dealer contracts financed on terms in excess of three years had declined from 85% to less than 10%, with a corresponding decline in the attendant risks of the financing program. There is little question as to the value of a financing plan in expanding the volume of sales. Of more concern is the apparent effect of the revision. An analysis of the trend of sales discloses very little variation because of the adoption of a more rigid control that directed dealer activity away from the lowest income bracket.

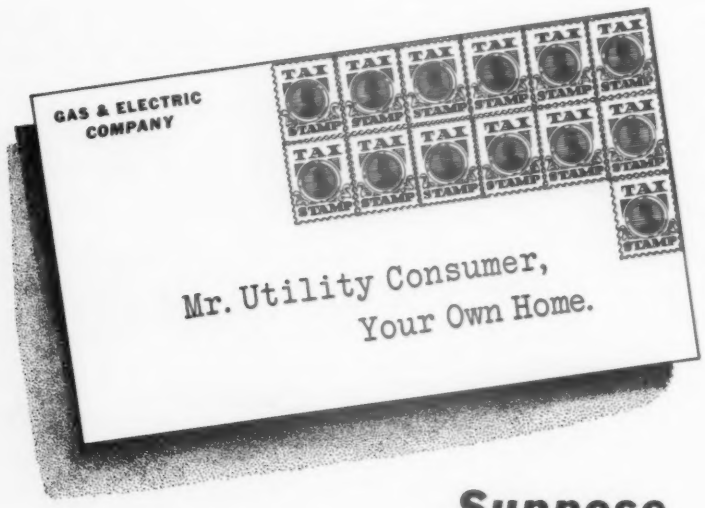
By discouraging the concentration of dealer activity in the lowest income market, the other highly important markets should receive a more equitable amount of attention. In our anxiety to cover the mass market, it is well not to overlook the function of the higher income groups in developing and maintaining customer acceptance. Practically every line of merchandise, whether it be extreme feminine millinery or, more to the point, household equipment, has its inception as a high cost promotional item with the upper income group and if accepted by the middle group, the volume of sales grows until finally we have mass distribution through low cost production. Entering this mass market prematurely through an "easy payment" purchase plan is not in itself suffi-

cient protection. If this gain is to be preserved, we must withstand any competitive invasion of the higher income groups. The urge to "Keep up with the Joneses" is too powerful a buying motive to be disregarded.

Other Factors That Arise

I have discussed only the major points; there are many collateral problems encountered by a utility in conducting a financing business. From the merchandising standpoint, there are special terms for builders, multiple family dwellings, and commercial establishments; special plans for buyers who can settle the account within 90 days and for prompt paying customers who are completing their present contracts. Accounting problems arise in handling contracts paid up in advance of maturity, transferring contracts between districts or companies, establishing adequate reserves to cover repossession losses, and accounting for the reconditioning and resale expenses involved. From the servicing angle, there is the fulfillment of the manufacturer's warranty and the elimination of faulty and hazardous conditions when installing an appliance. These and sundry other problems are constantly arising.

In conclusion, I would like to emphasize four of the requisites of a practical financing program for utilities. (1) It should be of sufficient breadth to cover the markets being sought by competitors. (2) The credit department should operate swiftly and thoroughly, but not with a severity that would nullify the objectives of the program. (3) Collection procedures should insure prompt and decisive action on delinquent accounts. (4) Dealer activity should be directed to provide proper coverage in all markets. When the financing program embodies these features, the entire industry thrives from a supply of credit that is both adequate and controlled.



Suppose gas and electric bills bore tax stamps

Statements sent to customers would be startling indeed. The tax burden of U.G.I. subsidiary gas and electric companies for 1937 amounted to $9.90 for each customer served and this amount has increased each year: for 1936 it was $9.89; for 1935 it was $8.65; for 1934 it was $7.47.

Yet, despite a doubling of the tax burden in the last 10 years, rates have been consistently reduced—a total of $19,000,000 on an annual basis.

At the same time, stockholders of U.G.I., typical, thrifty American families, have received a regular return on their investment, and the workers have enjoyed fair and dependable employment.

U.G.I. is proud of its record of operating efficiency and economical management, but the continuance of this balance between customer, stockholder and worker depends upon the hand of the tax collector. Taxes are beyond our control.

THE UNITED GAS IMPROVEMENT CO.

DEDICATED TO SERVING THE PUBLIC SINCE 1882

Displacement of Nitrogen from and Its Solution in Certain Reagents During Volumetric Gas Analysis

This paper by Joseph R. Branham and Max Sucher, National Bureau of Standards (Research Paper Rp1113) deals with errors in volumetric gas analysis caused by the displacement of nitrogen from and its solution in liquid reagents when these are used to remove a reactive gas from a gas mixture. The data show that measurable volumes of nitrogen may be exchanged between the gas sample and the reagent, as well as between the atmosphere and the reagent at the surface of separation in the atmospheric arm of the pipette. Volumetric errors may also result from the change of solubility of nitrogen in the reagent with temperature when heat is liberated during the absorption of a reactive gas. Errors from these sources are roughly proportional to the solubility of nitrogen in the reagents.

Distribution System for Centerville, Miss.

Mayor B. L. Robertson of Centerville, Miss. has called for bids for a natural gas distribution system to be opened Oct. 11. Equipment needed will include 80,000 feet of two-inch pipe and 9,000 feet of one-inch. The town will tap a line running between Natchez and Baton Rouge, about 10 miles away. The city will vote Sept. 27 on a bond issue to finance its part of the cost, the other being supplied by a WPA grant already authorized.

Gasco Briquets by the Carton

Believed to be a new "first," furnace, fireplace and range fuel is now offered in packages. The Seattle Gas Company, Seattle, Wash., is featuring Gasco Briquets in colorful, sales-designed cartons to sell for twenty-five cents. The cartons are 7 inches x 8 inches x 14 inches and hold twenty pounds of Briquets. Fuel dealers throughout the city carry them. The small quantity and reasonable price help to introduce Gasco Briquets to many persons who would not order a larger quantity for a trial. In addition, the convenient package is welcomed by those who have a limited storage space.

New Law of Contracts Involving Gas

By
Leo T. Parker
Attorney at Law
Cincinnati, Ohio

IN order that readers shall clearly and quickly understand and appreciate reasoning of higher courts in the litigations subsequently listed and reviewed in this article it is well to know that any and all contracts are invalid if *either* of the following points regarding it may be answered in the negative:

(1) Did one party submit an offer which the other unconditionally accepted?

(2) Did both parties agree absolutely to perform a definite act or thing?

(3) Were both parties of legal age and of sound mind?

(4) Did both parties have proper authority to make the contract?

(5) Were the objects of the contract lawful and not against public policy?

Another important point of the law is that a written contract, where the meaning is doubtful, must be given that construction which is unfavorable to the party who prepares or writes the contract.

For example, in Macon Gas Co. v. Crockett, 198 S. E. 267, reported September 8, 1938, a higher court held that where a gas company and a consumer makes a written contract by which a gas company lays an extension of its gas pipes along a certain street so as to convey gas to an owner of property on the street, in consideration of the property owner paying a designated sum of money to the gas company, and which contract provides that this extension shall remain the property of the company and that the company shall have the right to continue the extension to other property, a provision in the contract, written and prepared by the gas company, that the company shall refund to the property owner a designated sum of money "for each and every consumer taken on said extension," within a designated period from the date of the c mpletion of the extension, provided the total amount of refund shall not exceed the total amount paid by the property owner for the construction of the extension, a consumer of gas "taken on" the extension is any consumer of gas who receives it from this extension, whether directly by a service pipe attached thereto, or indirectly by a service pipe attached to a main or pipe running from the extension.

This court established this law because the gas company's representative had written the contract.

The facts of the case are that a consumer being desirous of having the Macon Gas Company serve his house with gas, entered into a written contract with the gas company, which was prepared by the company and presented to him for signature.

The contract provided that the gas company shall refund to the consumer (Crockett) $75 for "each and every consumer taken on said extension," meaning the gas pipe made and constructed by the gas company a distance of 1710 feet.

The counsel for the gas company contended that under a proper construction of the contract the consumers of gas, by reason of the connections made to the pipes which tapped and *extended from* the 1710 foot extension are not consumers "taken on" the Crockett extension, and that therefore the company is not, under the contract, bound to refund money to the consumer for tapping the line and connecting to it for purposes of serving consumers not directly supplied from the line. However, the higher court held the company bound to refund money to the consumer, and said:

"The gas company had taken Crockett's money, which amounted to $1,812.60, under an agreement with him to refund a portion of it in the amount of $75 for each consumer taken on the Crockett extension. Whenever a consumer was taken on, the gas company immediately became liable to Crockett, and it was its duty to pay Crockett the amount contracted to be paid. . . . The contract here was written by the defendant, gas company. It will therefore be given that construction favorable to the plaintiff (Crockett), namely that a consumer "taken on" the Crockett extension is any consumer whose gas comes to him through the Crockett extension, although he may not be directly connected with the Crockett extension, but is connected by a service pipe with a pipe or main tapping and extending from or conveying gas to the consumer from the Crockett extension."

Function of Municipality

A municipal corporation can function only through the powers granted by the Legislature in its charter of incorporation, or those powers incident or related thereto as essential and necessary to carry out the declared objects contained in such express powers. Beyond such grants of authority, a municipality possesses no powers by implication to make a valid contract.

Moreover, if there is doubt as to the existence of authority, or whether an act or contract is fairly referable to any of the delegated powers, the doubt must be resolved *against* its existence. Further, the power which the city exercises must not contravene any constitutional limitations, either state or federal. When a municipal corporation engages in an activity of a business, rather than one of a governmental nature, such as the supply of gas, which is generally engaged in by individuals or private corporations, it acts as such corporation, and not in its sovereign capacity. The relation to the public created by its ordinances are in such cases, *not legislative, but contractual.*

For these reasons an agreement of a city to supply gas free of charge is discrimination against other users and void as against public policy. There is no difference in this respect between a municipality dealing in a commodity of a public interest, and a public service company dealing in a commodity of a similar nature. The discriminatory engagements of both are prohibited as matters of public policy, because the effect is to increase the burden on the part of the public to their prejudice.

See, American v. Haven, 135 Atl. 727, in which it was disclosed that a municipality operates its own water supply, and for more than 25 years it offered, as an inducement to corporations intending to locate in that city, free water for a period of 10 years. Litigation developed when the City Council altered the system of service, placed meters in *all* establishments, and fixed a per thousand gallon rate.

A charge, under this schedule, was made against one of the manufacturers who held a contract with the city that free water would be supplied for 10 years.

The manufacturer instituted legal proceedings to restrain the city from charging for water until the 10 year period had expired. However, the court held the contract invalid and stated that the city was within its legal rights in charging the manufacturer a reasonable rate for the water consumed, notwithstanding the contract in which the city had agreed to furnish free water.

In another leading case, Suburban Co. v. Oakmont Borough, 268 Pa. 248, the higher court, in commenting upon the nature of a rate contract made by a gas company said:

"When a rate becomes effective, it is a rate established by law. It cannot be varied by the parties, and the company departs therefrom at its peril. . . . All public service contracts are viewed in the light of having been made with an implied provision that the rate named therein is subject to change, according to law, so as to keep it reasonable and nondiscriminatory at all times. . . . The reason for this rule is simple, as shown by the many cases which hold that the change of a rate fixed by contract for the performance of service by a public utility company does not impair the obligation of the contract under the Constitution of the United States, and, if it did, the change would be unlawful. . . . It is beyond the power of the contracting parties to fix the rates permanently, and the contract remains in full force and effect, binding on both parties as long as the obligation is unimpaired."

On the other hand, a contract that is reasonable with respect to duration and the rate charged is valid and enforceable, provided the parties making the contract were authorized to enter into the agreement.

Changing Status

Various courts have held that a gas company that supplies natural gas to industrial consumers and a few domestic consumers for profit under private contracts, and has considered itself to be subject to the rulings of the Public Service Commission is a public utility and is subject to obligations, including the payment of excise taxes, penalties and maintenance fees, even though it has not accepted public franchises and does not furnish its product to the general public indiscriminately.

For example, in State ex rel. Bricker, Atty. Gen., v. Industrial Gas Co., 16 N.E. (2d) 218, reported August, 1938, it was disclosed that state authorities sued a gas company in the sum of $16,679.96, with interest, for excise tax, penalty, and maintenance fee.

The authorities averred that the company was a public utility incorporated in the state of Ohio and duly organized and existing under and by virtue of the laws of the state of Ohio, and is engaged in the business of producing, acquiring, distributing, furnishing, supplying, transmitting and selling natural gas for light, power and other purposes in the state of Ohio.

The answer of the gas company admitted that it is an Ohio corporation but denied that it is a public utility corporation and denied any indebtedness to the state of Ohio.

The company officials proved that the company had sold gas for industrial purposes under special contracts made to different industrial concerns, and that the domestic consumers served were those residences which were near the pipe lines of the company; that the company made no extensions to its lines for the sole purpose of furnishing gas service to domestic consumers and that it never held itself out to serve the public domestic natural gas service indiscriminately. Also, it was proved that the company has never been authorized to place its pipe lines in any public street, highway, road, alley or way.

Notwithstanding these facts the higher court held the gas company a public utility and subject to a public utility's obligations, such as payment of excise taxes, penalties and maintenance fees. This court said:

"It cannot be said under the agreed statement of facts that the product and service of the gas company is available to the public generally and indiscriminately, or that there has been an acceptance by the company of public franchises. . . . Inasmuch as everything indicates that the company considered that it was a public utility and so conducted its business, it is contemplated that its classification may only be changed by following the law set up for the abandonment of the business of a public utility."

Business Relationship

It is a well established law that whenever the relation of any business or enterprise to the public, or to any substantial part of a community, becomes so close as to make the welfare of the public, or any substantial part of it, depend upon the proper conduct of such business, then it becomes a subject upon which the regulatory power of the state may be exercised for the benefit of the whole.

For illustration, in Colorado Interstate Gas Company, P.U.R. 1933E, 349, the court said:

"Notwithstanding the claimed power to reject business of some customers and to fix different standards for different customers, a pipeline company furnishing a wholesale natural gas supply to industrial consumers through local distribution systems was held to be a public utility subject to commission regulations, since it held itself out to serve the public generally if it could make proper terms with the various parties seeking such special service."

Variation of Law

Some older higher courts have held that a dedication of private property to public utility service will not be presumed from the fact that the product and service of the use of such property is the usual subject-matter of utility service; neither does such presumption arise from the sale by private contract of such product and service to utility corporations for purposes of resale. Such dedication is never presumed without evidence of unequivocal intention.

In other words, to constitute a "public utility," the devotion to public use must be of such character that the product and service is available to the public generally and indiscriminately, or there must be the acceptance by the utility of public franchises or calling to its aid the police power of the state. For variations of the law on this subject, see: 241 U.S. 252; 179 Cal. 68; Village of St. Clairsville v. Public Utilities Comm., 102 Ohio St. 574; State Public Utilities Comm., 270 Ill. 183; and Richmond v. Carneal, 129 Va. 388, 106 S. E. 403.

Implied Contractual Relations

Obviously, all gas company officials are expected by law to perform reasonable services to consumers irrespective of contracts. And when

(Concluded on page 88)

Compensating Salesmen for Use of Automobiles

A Survey Shows How Gas Companies Handle This Problem

by

Arthur Roberts

A RECENT survey of eastern gas companies, has disclosed the widely varying methods of compensation applied to the salesman's automobile. This has been more or less of a "sore spot" with salesmen in all fields, even when car compensation is paid, because often they feel that the compensation allowed is insufficient and consequently, a deduction from income.

Work sheets covering this field survey disclose that 40 per cent of the companies pay no car allowances. Of the remaining 60 per cent, our breakdown shows:

30 per cent pay a flat rate per mile
65 per cent pay a flat rate per week or day
5 per cent pay actual operating expenses

The average flat rate per mile allowance is 4 cents; the average per diem allowance is $2; the weekly allowance averages $10.

In the opinion of most executives it is impracticable to compute the operating costs on all salesmen's cars when paying a flat mileage rate. An average figure must be obtained. To get this figure, the general method is to consider $1,000 as the price of a car and 20,000 miles yearly an average mileage figure, then compute the gas, oil, lubrication, tire upkeep and repairs, otherwise known as the variable expenses. Also there is included an average figure for depreciation, garage rent, license and insurance, called fixed expenses. Dividing the total expense figure by 20,000 gives the flat rate per mile allowed the salesman for car compensation. The depreciation is generally estimated at 25 per cent of new car cost.

This company allows its salesmen a flat rate of 4 cents per mile arrived at by dividing $842 estimated yearly cost of operation by the estimated mileage, 20,000 miles.

It may appear that this computation is high for some cars and low for others; and although sales directors admit that occasionally there is dissatisfaction on this score, they are able to soothe ruffled dispositions by showing that, in the long run, it averages up fairly well. Depreciation at 25 per cent of original car cost may seem low to some when average mileage is computed at 20,000 yearly, but this figure is recommended as a fair average. Some salesmen hold their cars for a number of years, others trade them in after the first year. Experience has shown that what the salesman with the old car may gain on the depreciation allowance, he loses in excessive gas and oil consumption and bigger repair bills than the owner of a newer car. The expense of license, insurance and garage rent differs with the car and salesman but these differentials mean little in the final computation of the flat rate per mile.

In paying flat rates per day or week, we find that these figures are set arbitrarily in 80 per cent of the cases, but we also discovered that more than half the sales directors using this plan stated that salesmen were frequently dissatisfied with it due to the variables in car operation and territory. The salesman who covers 500 miles weekly resents the fact that another salesman covering 300 miles weekly receives the same allowance for car operation. Some territories require more car coverage than others. A salesman working an outlying or rural section does more driving than a salesman working a closely knit territory where he can park his car in a neighborhood and canvass on foot. We find that there is a trend, where paying daily or weekly car allowances, to consider the mileage covered and territory and to vary allowances accordingly. Those who have already adopted this change state that it has eliminated discord in regard to salesman car compensation.

How Car Allowance Is Computed

Here is an example of how one company arrived at its estimate for car compensation.

Gas—20,000 miles—15 miles to gallon—18c gas	$240
Oil—1 quart to 5 gals. gas—267 quarts at 25c	67
Tires—4 tires—20,000 miles	50
Lubrication	15
Repairs and replacements—10% of car cost	100
Garage rent	60
License	10
Insurance—fire, theft, public liability	50
Depreciation	250
Total	$842

5% Pay Actual Operating Cost

Theoretically, it would seem that the fairest way to compensate salesmen for car use would be to pay the actual expenses involved; but in all fields, only about 5 per cent of the companies employing outside salesmen use this method. Their sales directors seem to think that there are too many practical obstacles in the way. Where companies pay actual car expenses, a report form is filled out, giving mileage per day, territory or route covered and general car expense paid in detail. Speedometer readings also appear on this report. These expense sheets are kept in a binder and checked up from time to time to note excessive expense items or unwarranted general increases in operating costs. Sales directors experienced with this plan say that salesmen are just as honest about making out car expense returns as they are with other reports; and in most cases, these expenses are no greater in the long run, than a flat rate per mile or weekly allowance. On the other hand, this plan seems to be most acceptable to salesmen, say executives using it.

Some companies use the car allowance as a sort of bonus. If a salesman sells a certain quota of gas appliances, the car compensation is allowed. If he falls under the quota, he receives no car compensation. Some companies gear the car allowance to the sales volume. For example, a $2 allowance for every $100 in sales closed, the ratio depending upon the proposition and not susceptible to standardization. Other companies split the car expenses, usually 50:50, but here too, most companies absorb all the expense if the salesman reaches a stipulated quota of sales.

Car Allowance Influences Sales Effort

The bane of all sales directors is the salesman who purposely skips a

(Continued on page 88)

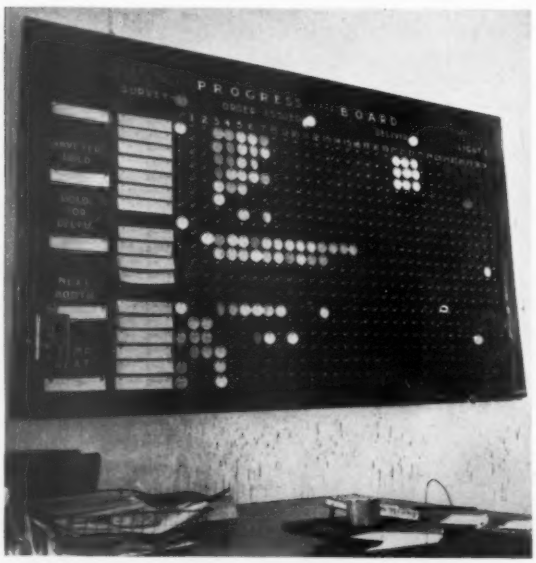
Progress Record Board Peps Up Activities of Gas Appliance Salesmen

by

John E. Hubel

FOR a sales department of a gas company, or for any dealer specializing in gas appliances, it is an easy matter to go through the unfilled orders periodically to see how the volume of new business is coming in. But when such business increases to an extent that makes it impracticable to check the order files occasionally, an order progress board comes in very handy. It will tell the story of progress at a glance.

Such a progress board is in use in the gas appliance sales department of the Milwaukee Gas Light Company, Milwaukee, Wisconsin. The picture will give an idea of its workings. This board not only shows the unfilled orders for gas appliances on hand, but also shows the surveys made by the company's engineers, and shows the transfer of surveys to the order record when the salesmen have succeeded in signing up the prospect.



Progress Board Used in Milwaukee.

This particular board is used only to record the prospects, sales and installations of gas furnace apparatus during the current month, that is, the surveys, sales and installations of equipment necessary to convert existing coal fired furnaces or boilers to gas fired type in residences.

The progress board is divided into 31 vertical columns for days of the current month, with 16 horizontal lines of pins on which vari-colored circular cardboard discs are hung, giving information in briefest form as to prospective customer's name and address. In the case of the board illustrated, about four horizontal lines are given over to one engineer-salesman, the man who made the original survey at the customer's request. At the left this engineer's name appears on a white disc, placed at the head of the first of four rows of pins assigned to him. In the four horizontal rows to the right of the white disc, each separate survey is identified by an orange one, under the date on which the survey was made. On this orange disc, the address of the prospect is given. The survey is followed, and as the prospect capitulates and the survey becomes a contract to install gas equipment in the furnace or boiler in the home, a green disc is placed on a pin under the date on which the contract is signed. If desired, the orange disc can be placed immediately under the green one, so that it can readily be ascertained what time elapsed between making the survey and signing of the contract.

As the work is in progress on this particular conversion job, a disc of another color is hung on a pin under the date on which the work was started, the customer's name and address, with other brief notes, also appearing on the disc, which may be pale yellow, or whatever color scheme is adopted.

	Job No.	
NAME	ADDRESS	
HEATING UNIT	SOLD BY	DATE .....
ENGINEER	DATE OF SURVEY	
ORDER ISSUED	DELIVERED	
LIGHTED	CHECKED	
HOLD		
TEMPORARY HEAT		

Job Card Actual Size as Used on Progress Board

When the job of conversion has been completed in the customer's furnace or boiler, a tag of another color, perhaps pink, can be put under the completion date, as such installations may have to be inspected for a few days after completion, to make sure the customer is satisfied.

In addition to the use of cardboard discs for telling the story at a glance, a more detailed record is kept on a white Job Card, measuring about 1½ by 6 inches, as illustrated. These cards, one for each conversion order issued, is hung from two pins or hooks to the left of the sales engineer's white disc, so that anyone interested in getting more information about the order can get it off the Job Card.

Such a progress board, as installed in the sales department of the Milwaukee Gas Light Company, is not only of interest to the sales executives but is watched each day by others in the sales department, especially by the engineers and salesmen who are responsible for surveys, sales and installations made by themselves or by others in the same department. It becomes, in fact, a sort of a baseball score board, as it is just too bad when a survey stays unmoved on the survey section of the board without being advanced to the sales and installation stage. Salesmen in this division vie with each other to make the best showing on the board; this being different from "invisible" competition, as results can be seen by anyone having access to that part of the sales department in which the progress board is located. It does much to pep up the morale of the sales department, the management declares.

Meter Fellowship Established at Mellon Institute by Pittsburgh Equitable Meter Company

Dr. E. R. Weidelin, Director of Mellon Institute, Pittsburgh, Pa., has announced the establishment of an Industrial Fellowship on meter technology by the Pittsburgh Equitable Meter Company.

DR. R. L. WAKEMAN

Among the first projects to be investigated is the development of a satisfactory substitute for the present leather diaphragms used in gas meters. Modern research developments have led to the production of synthetic resins of a wide variety of useful properties which are to be considered for application to this problem. The gas industry itself might be called upon to supply the raw products from which to manufacture materials of construction for its meters.

Dr. R. L. Wakeman is to be the incumbent of this Fellowship. He was trained at Massachusetts Institute of Technology, from which institution he received the degree of Ph.D. in 1930. After two years of post-doctorate study at Paris and Zurich he held a position in industry until he joined the research staff of the Institute in 1935. Dr. Wakeman, in addition to his broad training and experience in various fields of chemitsry, is an authority on synthetic resins and plastics.

In commenting on the Meter Fellowship, Colonel W. R. Rockwell, president of the Pittsburgh Equitable Meter Company, stated: "It can be safely said that a very great part of the rapid progress in industry of today has been the result of the close link between science and technology. Our Company owes its existence to the pioneer work of its founders, including such men as George Westinghouse and Fred Holdship. Mr. Horace Chrisman, who has been with us for over fifty years, worked directly with Mr. George Westinghouse and at present has a number of new meter developments ready for application. We have always maintained and will continue to maintain completely equipped and staffed chemical and physical laboratories which are constantly searching for better metering methods and materials. The scientific and technological problems involved in producing something better sometimes require intense research by scientists who can devote their entire time and energy to solution in a manner which cannot be expected from laboratories dealing with daily practical problems."

Sales Cooperation Course of A. G. A.

Early in October the American Gas Association will bring out a "Course in Sales Cooperation for Everyone in the Gas Industry."

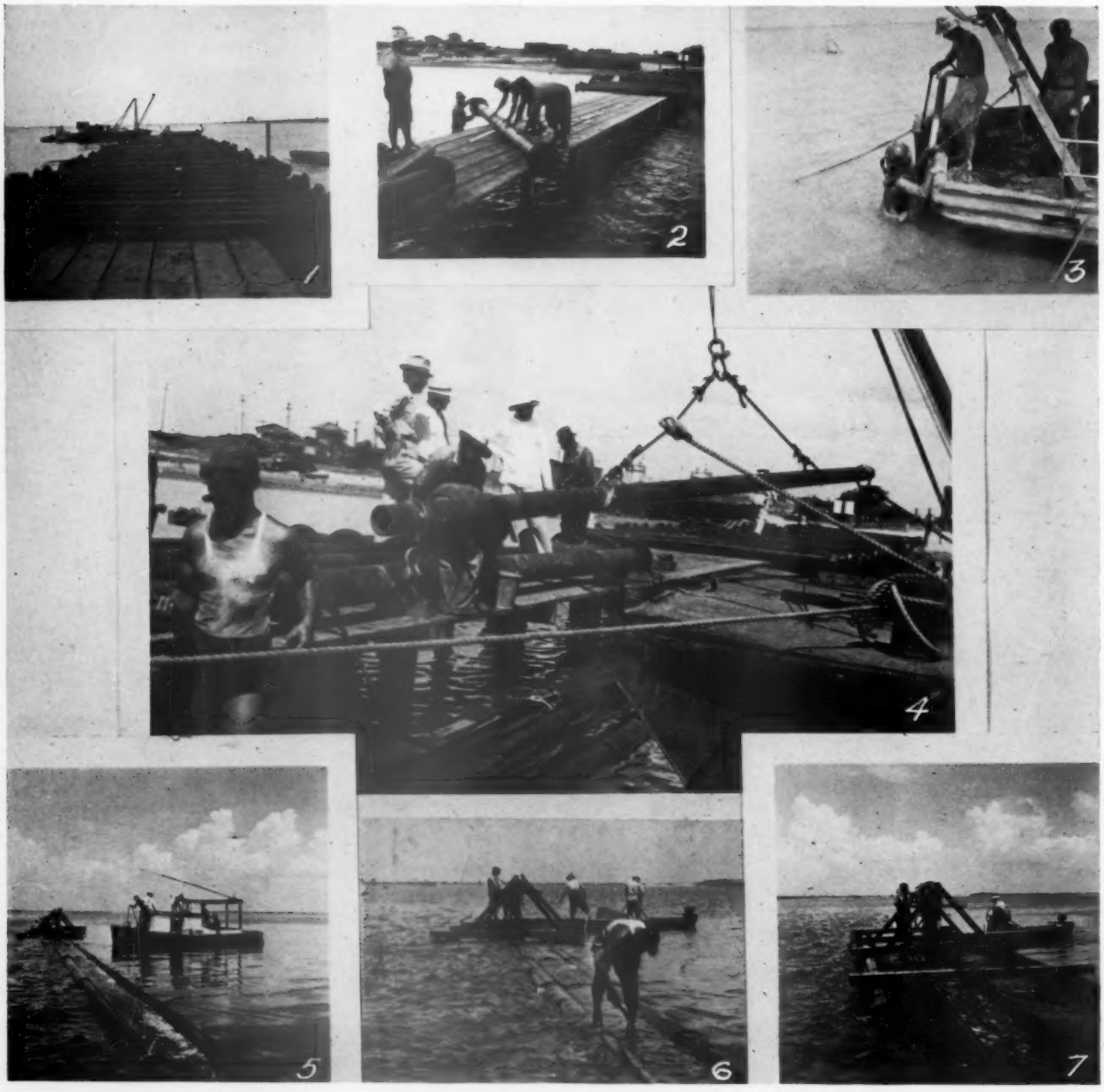
Gas companies which have enlisted the cooperation of non-selling employees in aiding the sales department have been deeply impressed by the results obtained. However, the plans for securing such employee cooperation have varied widely. This course has been developed to give every company and every employee the benefit of the best methods and tactics.

Coming out at the same time as the "Course in Selling Residential Gas Today," shortly to be offered to the sales departments in the gas industry, the new course should provide a rounded program for unifving gas company personnel in the 1938-39 sales drive. The central purpose of this Sales Cooperation Course will be to show all employees how to "sales-slant" both their business and their social contacts with the public, with a view to furnishing the sales department with a steady flow of leads.

As a basis for the course, a study is being made of general employee sales cooperation plans not only in the gas industry but in many other industries as well. Out of this study will come an organized body of information which should increase the effectiveness of sales cooperation plans in companies now using them, and enable companies which have not yet inaugurated such plans to start off on the soundest possible basis.

The official announcement of the Course in Sales Cooperation will go out to the industry early in October. At this stage, however, it can be stated that the Course will provide every employee with four kinds of information essential to proper representation of his company in his contacts: (1) detailed knowledge of the *selling* facts about gas; (2) up-to-date information on the new appliances; (3) definite things to say and do when talking to gas users; (4) practical, careful guidance in turning contacts into sales leads.

Placing The Cast Iron Main Across Galveston Bay



Texas Cities Gas Company replaced one of its two 8-inch supply lines crossing Galveston Bay parallel to and a few hundred feet Northeast of the Causeway, June and July, 1938. The replacement was due to damaged steel pipe resulting from salt water, chemical and electrolytic action, to the extent that expensive leaks resulted. The replacement was with 8 inch ball joint Molox Cast iron pipe.

(1) Twenty-seven tons of 16 foot lengths Molox Cast Iron Ball Joint pipe on construction pier.

(2) Pipe was rolled out onto the construction pier by hand. Near the end of the pier it was turned on a turn table parallel to the pier and then pushed into position for bolting two lengths together preparatory to loading onto the carrying pontoon.

(3) Deep sea diver descends to bottom of Bay to attach hoist rope to Island end of trans-bay pipe line which is to be connected to the new line laid across Galveston Bay.

(4) Steel barge derrick hoist boom used to load two length sections from pier to carrying pontoons. Inspecting the hoist are left to right: P. E. Nicholls, Galveston division manager, Texas Cities Gas Co.; Wallance M. Norton, Galveston division engineer, Texas Cities Gas Co.; and L. B. Denning, Jr., vice president and operating manager, Community Natural and Texas Cities Gas Companies.

(5) Newly arrived section has been bolted-up. Tug disengages and prepares to hook onto empty pontoon from which rope slings are being cut. The tug will tow the empty pontoon back to the pier for another load.

(6) Workmen cutting rope sling. Laying pontoon and tool raft in background.

(7) Laying pontoon, showing its position relative to carrying pontoon. In this picture the laying pontoon is being walked to the end of the line after it has been used to assist in easing the pipe down into the water.

Placing a Trans-Bay Cast Iron Service Line

Texas Cities Gas Company Replaces 8000 Feet of Steel Pipe with 8 Inch Cast Iron Main

A winning battle against the sea to insure Galveston continuous and dependable natural gas service was completed in July by Texas Cities Gas Company when it replaced more than 8,000 feet of one of its two 8-inch main lines in Galveston Bay. This project was the fifth major replacement and the largest marine pipe line laying job undertaken since the company laid the original two miles of 8-inch dual lines in the bay in 1928 and 1929.

The new line was laid by regular employes augmented by twenty-one Galveston laborers and was under the supervision of Paul E. Nicholls, Texas Cities manager at Galveston.

One of their most serious operating problems, according to Mr. Nicholls, is maintenance of pipe in salt water in the bay and on land below tide water level. Salt, chemicals and stray electric currents in sea water destroy these metal pipes rapidly and we are compelled to make replacements almost constantly to insure a dependable and continuous natural gas service to Galveston Island.

Special Equipment Necessary

The finished job gives the company one complete cast iron main line in the bay between the island and mainland, approximately two miles. It is one of the largest undersea natural gas pipe lines in the United States and one of the largest continuous cast iron submarine pipe lines, according to company engineers. The pipe is a newly developed cast iron which has proven more resistant to sea water ravages than other types of metal used.

A specially developed ball and socket joint for underwater use permitted flexibility necessary in laying the pipe on the floor of the bay.

Each cast iron section was sixteen feet long and weighed 800 pounds. They were made up into eight joint lengths on a pier and towed out to position on specially constructed pontoons. A company designed marine pipe line laying barge enabled workmen to connect the 128-foot lengths to the bay line which was then cut loose from the pontoons and lowered into the bay as each section was connected up. The barge kept the open end above the water until the next section was towed into place and bolted on.

Two 128-foot pontoons, constructed from salvaged 14-inch steel pipe, were necessary to float the cast iron sections. The pontoons were filled with air under twenty pounds pressure. Heavy rope slings were tied around the two pontoons forming cradles into which the cast iron sections were loaded for towing. The sections rode between the pontoons into laying position. After each section was joined to the line, the rope slings were cut, allowing the cast iron sections to drop into the bay. Total weight of loaded pontoons was seven and one-half tons.

More than one mile of ropes and cables was used on the project. Several tons of bolts were used to fasten the special underwater ball and socket joints. Approximately 500 joints were necessary.

Replacement work on one bay line was carried on without interruption to Galveston gas service. Two lines were maintained across the bay. One line brought gas to the city while the other was being relaid.

After the pipe was on the bottom of the bay, a deep sea diver lowered it into a trench by jetting mud from beneath the pipe with a powerful stream of water. The entire 8,000 feet were trenched to protect the pipe from tidal action and displacement.

Blue Blaze News.

The New A. G. A. Salesmen's Training Program

The new American Gas Association salesman's training course, mentioned in the September issue of the JOURNAL will be officially announced early in October. It is expected that many companies will begin using it before the end of that month.

Since 1928, when the old Domestic Sales Training Course was prepared, competitive conditions, selling methods and appliance design have changed considerably. As conditions are modified and products are improved, sales methods and procedures must also be modified and improved to keep pace with them. However, many gas companies have not brought their selling methods fully up to date. For this reason the new course is being given the general title of "Selling Residential Gas Today."

The emphasis of the course will be put on the methods that have worked in 1938 for outstanding salesmen in selling the benefits of gas service and gas appliances. The outstanding points of the new gas appliances will be presented in the terms that successful salesmen of today actually use in talking to customers. Observation has shown that sales often depend on the impressions gained by customers from apparently unimportant phrases used by the salesman. Consequently a feature is being made in the course of the precise wording that wins the interest and arouses the desire of customers.

In addition to discussions of the broader aspects of his job, the salesman will find in the course answers to the down-to-the-ground questions in his mind. Such questions as these are among the hundreds dealt with:

—Which works better today, a service approach or a sales approach in making the first contact with customers?

—What procedure should be used if the prospect will not give you a chance to sell?

—What questions about the old appliances of customers arouse their interest in new appliances most quickly?

—How can the price discussion be postponed until sufficient interest in the appliance is aroused?

—What phrases are most convincing to customers in talking about CP cooking performance?

—What is the best method of getting the wife's help in selling the husband?

—In what price range should a salesman begin a salesroom demonstration—with a medium, high, or low-priced appliance?

—How can comparative water-heating and house-heating cost estimates be dramatized for customers?

—How can negative selling be avoided in talking about safety?

—What is the best way of meeting unscrupulous competition?

—What tactics work best with rented-house prospects?

—How can the salesman provide himself with a consistent flow of live leads?

Field Equipment For Servicemen

By

H. A. Johnstone

Southern California Gas Co.

IN spite of the fact that each year brings more highly developed and complicated gas appliances, the gas industry has been able—through its systematic training of servicemen, adequately equipped with a complete assortment of servicing tools—to render a distinctive and dependable service to its customers.

The dominant position that the gas industry holds today can be attributed in a large measure to an early appreciation of the importance of efficient domestic appliance servicing. The actual history of concentrated servicemen's training dates back some five years, when in anticipation of the increased complexity of all types of domestic gas appliances, they were directed through a well co-ordinated plan which enabled them to handle their jobs in a competent manner. This meant servicing appliances with a multiplicity of controls, concealed valves, and varieties of construction which required a large assortment of tools and special equipment.

The trend of the times brought up the question of necessary tools for a gas serviceman for these modern gas appliances, since they are debatable and depend to a large extent on the practice of each utility. Whether specialty men are used on water heaters, Electroluxes, house heating appliances, and ranges; or if the utility renders complete service on all appliances. Whether the territory served by the utility covers congested, metropolitan areas or scattered suburban districts.

The Southern California Gas Company—spread over an area of some 8,000 square miles, serving communities with from 500,000 to 50 meters—has very few specialty men, each serviceman being equipped with a full set of tools to adjust and/or repair any appliance. Provision being made by the company to add new tools, when found necessary, for new models and accessories. The list of tools given herewith is considered minimum for the modern, well equipped customer serviceman. Figure 1, shows the tools for the standard service kit.

Needless to state the list is submitted with the realization that some localities will require modifications to meet their special problem.

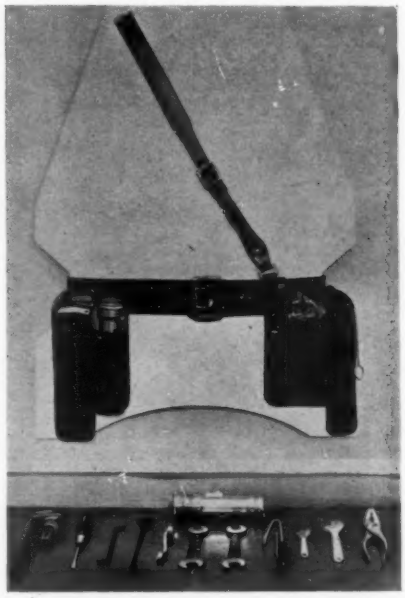
A report of the Subcommittee on Servicemen's Training presented before Pacific Coast Gas Association, Annual Convention, Santa Barbara, Sept. 14-16, 1938.

A questionnaire recently sent to our servicemen revealed that a great majority of the men did not carry all of their tools into the home on all service calls, and that on a large percentage of our service calls, a few selected tools were sufficient. It was therefore thought desirable to design a utility belt with leather pockets for a few selected tools which would speed up production, and facilitate the completion of jobs. Since each man is responsible for the tools that are charged to him, the fewer tools he takes on a job would tend to eliminate some of the lost tools problem, which is always embarrassing at inventory time.

A copy of the A.G.A. Range and A.G.A. Water Heater, two Electrolux Manuals (one published by Servel, and the other made up by the company), a heating manual and a forms manual showing the correct method in which work and reports should be recorded, besides an A.G.A. Commercial Kitchen Manual for men working on restaurant and heavy duty appliances, are issued to each serviceman. Inserts are prepared in a suitable size as new developments arise and sent out to the men.

Many special tools have been made up for use by servicemen, among them: a leather drill case; a furnace pilot lighter tip; a jointed handle refrigerator flue cleaner; an Electrolux adapter for taking pressure; a stove burner port reamer; bellows for purging furnaces; soap can.

In addition each District or Division office has drill gauges, Easy Outs, Rutz Lighter die and other special taps and dies, etc., that a serviceman may obtain on a Loan Order. Making tools available for every purpose, with the knowledge that the Industry cannot—at any time—afford to send ill-equipped men into the field.



Utility Belt and Tools Carried.

Tool List

1. Two pieces of Emery Cloth (No. 000).
2. Thirty orifice inserts.
3. Ten ¼ x 32 thread spud orifices.
4. Ten ¼ x 28 thread spud orifices.
5. Oven pocket-thermometer, 0° to 600°.
6. Refrigerator pocket-thermometer, 0° to 120°.
7. Leather case for drills, No. 30 to No. 80, incl.
   Drills: (2 each) No. 65 to No. 72.
   (1 ") No. 46 to No. 64.
   (1 ") No. 73 to No. 80.
   (1 ") No. 30 to No. 44.*
8. Lead block.
9. Handle—orifice reamer.
10. Order holder.
11. Furnace pilot lighter tip.
12. Jointed handle and refrigerator flue cleaner.
13. Orifice reamer—large.
14. " " —medium.
15. " " —small.
16. Orifice expander punch.
17. Orifice anvil block.
18. Pin vise—No. 162 (Small).
19. Three-inch level.
20. Center punch (No. 264-B).
21. Tap—⅛" standard pipe.
22. Electrolux adapter.
23. Stove bolt and orifice wrench.
24. File—6", slim taper.
25. " —6", round bastard.
26. " —8", flat mill.
27. Sash brush, No. 2.
28. Stove burner port reamer.
29. Grayson Allen set screw wrench.
30. Magic Chef orifice wrench.
31. Grayson orifice wrench.
32. Harper valve wrench.
33. Box-end wrench (⅜" x 7/16" — No. 8180).
34. Open-end wrench (¾" x ⅜").
35. " " " " "
36. Combination orifice socket wrench.
37. Copper base for oven thermometer.
38. Fourteen-inch length of ¼" hose (soft and pliable).
39. Pliers—6", thin nose.
40. " —6", bent nose.
41. Screwdriver—¼" x 6", offset.
42. " —1½" Stanley (No. 55).
43. " —3" Stanley (No. 177).
44. " —3" Stanley (No. 20).
45. " —6".
46. Swab brush.
47. No. 450 Angelus wire brush.
48. 2-ounce ball-peen hammer.
49. ½-lb " "

* Even numbers.

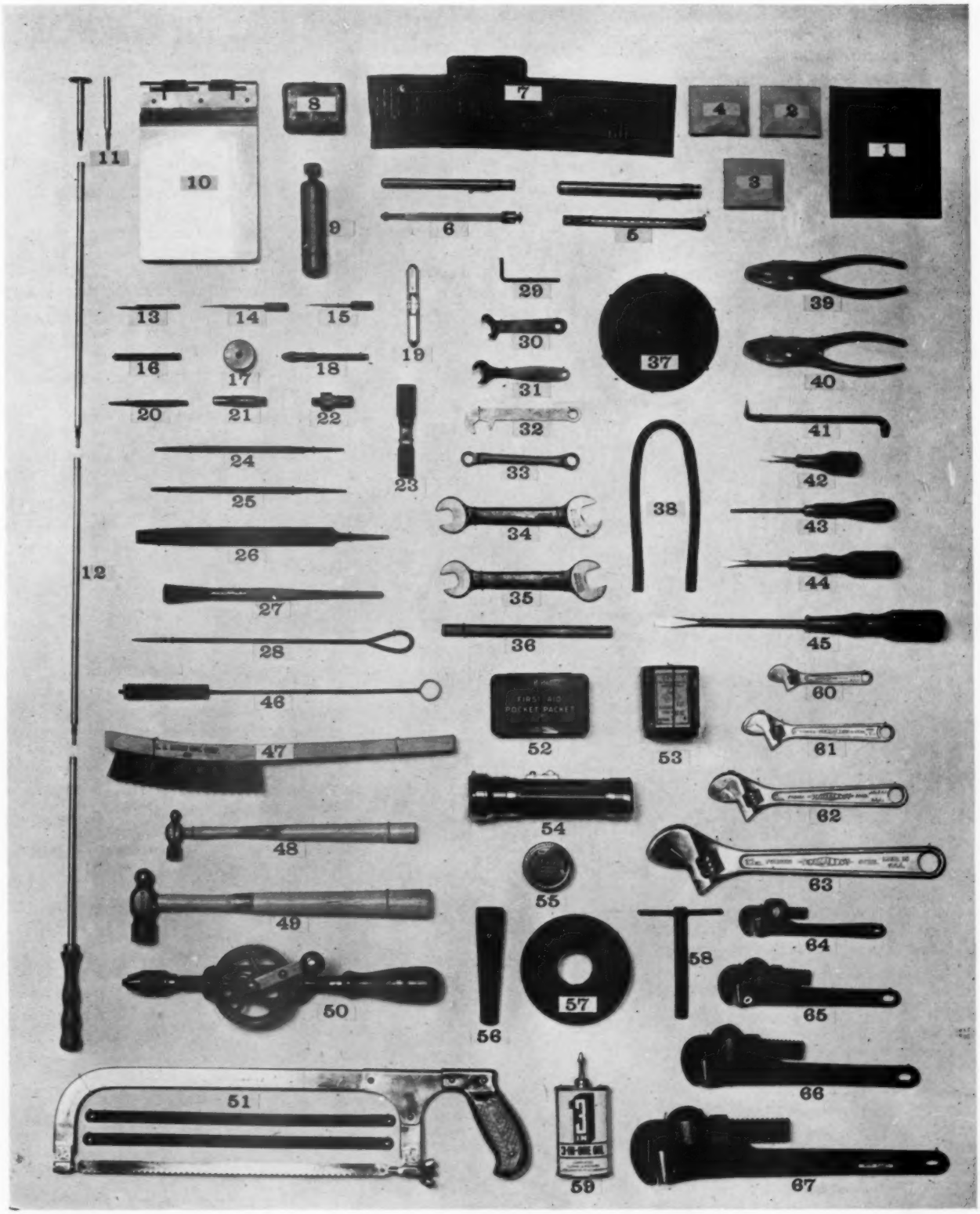


Figure 1.

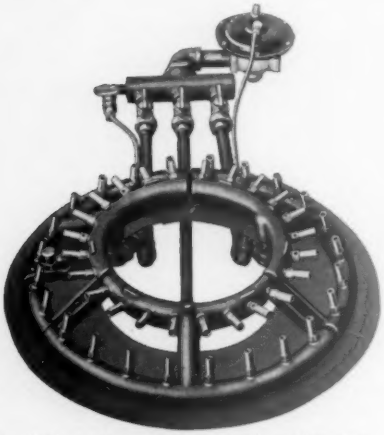
50. ¼" hand drill No. 5.
51. Hack saw frame and two extra 12" blades.
52. First aid pocket packet, No. 415.
53. Box of ¼" Palmetto packing (¼-lb. box).
54. Flashlight, complete.
55. Milwaukee No. 333 valve grease.
56. Wooden plug, ¾".
57. Roll of friction tape, ¾".
58. Reliance regulator key.
59. Can of "3-in-1" oil.
60. Crescent wrench—4", thin.
61. " " —6", thin.
62. " " —8", thin.
63. " " —12", standard.
64. Pipe wrench—6".
65. " " —8".
66. " " —10".
67. " " —14".
68. Six-foot length of ¾" hose, and bag.
69. Soap can.
70. Dope can.
71. 8-inch bellows and hose (furnace).
72. Manometer.
73. Two feet of ⅜" I.D. hose (soft and pliable).
74. Soap brush, No. 8.

New Equipment

Barber Brings Out "Flexible" Round Conversion Burners

The Barber Gas Burner Company, Cleveland, Ohio, announces new round burner assemblies for all furnaces and boilers. These units are built on the Barber "expansion principle," and eight models provide a sufficient range of flexibility in diameter to fit any round furnace or boiler. Adjustments are made at time of installation.

To illustrate this point, the No. 324 round burner shown here is adjustable in diameter to fit grate dimensions from 18" to 20½".



1.—Barber Burner set at smallest diameter.

While conversion burners for oblong furnaces have long been easily adjustable to combustion chamber space, round burner assemblies have not had this advantage. This development assures the proper size burner for each particular furnace or boiler.

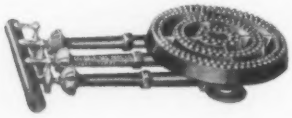
For most round boilers, burners are furnished with standard short nipples. For boilers having no clinker door, and for round furnaces, longer vertical nipples are included with the shipment. This choice of nipples enables the dealer to keep in stock assemblies which fit a wide range of both furnaces and boilers. Special span flame jets are furnished which, when inserted, correctly adjust the position of the flame itself in the expanded burner.

Burner assemblies can now be carried in stock, along with both sizes of nipples, and the dealer is thus enabled to equip a wider range of furnaces and boilers from a smaller stock.

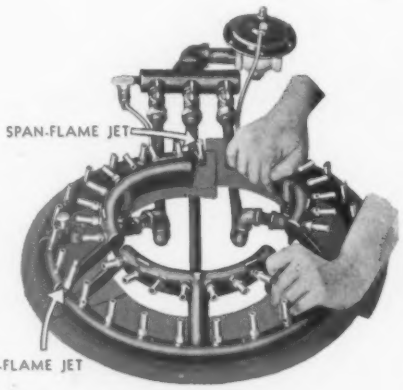
This principle of flexibility has been applied to the entire line of Barber Round Burner Assemblies, and the diameter and adjustments for each particular model are clearly shown in the new Barber Catalog 38, copy of which will be sent on request to the manufacturer, Barber Gas Burner Company, 3704 Superior Avenue, Cleveland, Ohio.

"Reliable" Triple Ring Burner

This triple ring burner head, cast in one piece, enables easy installation and eliminates fire hazard as it prevents the possibility of the inner burner getting out of alignment. Equipped with round face venturi mixing tubes and A.G.A. approved valves any of which may be used independently of the others.



This and many other gas appliances for shops, schools and factories are described in catalog just issued by Reliable Gas Products Co., 1020 Second Ave., S. W., Cedar Rapids, Iowa.

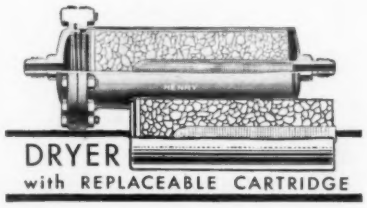


2.—Units swung outward to required diameter.

Cartridge Dehydrator

The new Henry Cartridge Dehydrator, originally designed for air conditioning and refrigeration, is for removal of moisture from chemicals in solution, and in air drying.

Major features of the Henry dryer are its patented dispersion tube and replaceable dehydrant cartridge. The perforated dispersion



tube—exposing the entire volume of dehydrant to penetration by the fluid or air extends along the center axis of the dehydrant column.

Refill cartridges make recharging of Henry dryers simple and easy. Cartridges are available charged with Activated Alumina, Drierite, Barium Oxide, Calcium Oxide or Anhydrous Calcium Chloride, at same cost. The flange shell construction of the dryer speeds removal and replacement of cartridges. Obtainable in complete range of capacities.

New catalog available through Henry Valve Company, 1001 North Spaulding Avenue, Chicago.

3.—Burner assembly spread to maximum size.

and Appliances

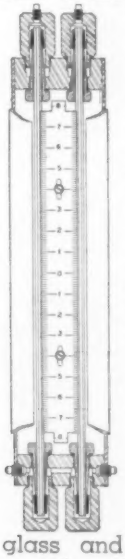
Portable Indicating Pyrometer

A new portable indicating potentiometer pyrometer announced by The Foxboro Company, Foxboro, Mass., is built primarily for temperature measurements where a permanent installation is not required. This meter is also useful for testing and standardizing service instruments and thermocouples, for exploratory work, and as a spare instrument.

An open, legible temperature scale, 17-inches in length, makes it possible to obtain readings to very close limits. Double range instruments have two scales, both of which may be for temperature, and for the same or different thermocouples. Each scale may be calibrated for millivoltage, or one for millivoltage and one for temperature.

New High-Pressure Manometer

A new straight tube, high-pressure manometer suitable for pressures up to 1,000 pounds is being introduced by the Daniel Orifice Fitting Company. The design of this Manometer, (Patent No. 2,088,777), permits the use of straight tubes which are sealed positively against leakage by synthetic rubber sleeves, thus eliminating strain or stresses in the glass. The construction does away with stuffing boxes and provides a compensating seal under pressure.



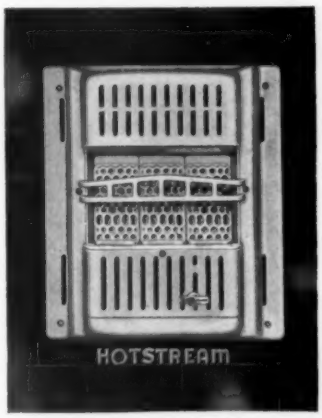
Because there is no U-bend and only the lightest contact between glass and metal parts, there is stated to be no distortion of the tubes when seal is made. Every part is easily accessible, impervious to gas, oil, gasoline, etc., and easily cleaned. If glass is accidentally broken, only one side need be replaced. Full details of the Wilcox Manometer available through Daniel Orifice Fitting Company, 3352 Union Pacific Avenue, Los Angeles, California.

Wall Insert Room Heater

A new gas fired wall insert room heater has recently been offered by The Hotstream Heater Co., of Cleveland.

These are suitable for comfortable heating of bathrooms, halls and small rooms at low cost.

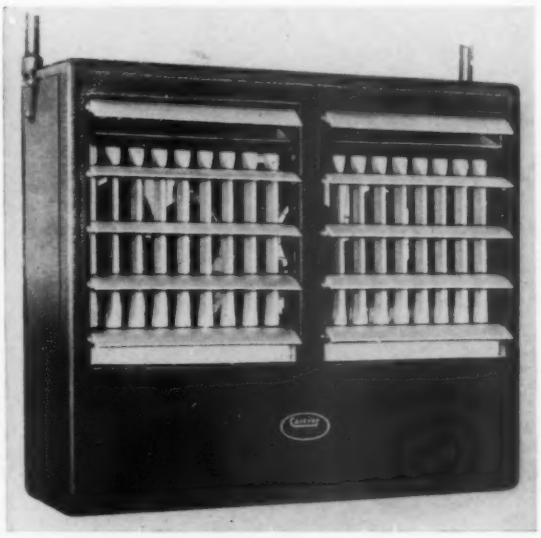
The heater is placed in a sheet metal wall box and the cast iron enameled front bolted to the box.



Direct radiation and conduction assure quick heating. Improved air ducts permit free and complete circulation of heat throughout the room.

May be installed in new or old buildings. Furnished in colors to match fixtures of leading plumbing equipment manufacturers.

Dimensions of type shown 18" x 20⅞". Capacity 12,000 B.T.U. per hour. Circular with all details on request.



Two-fan Carrier gas-fired unit.

Carrier Unit Heaters

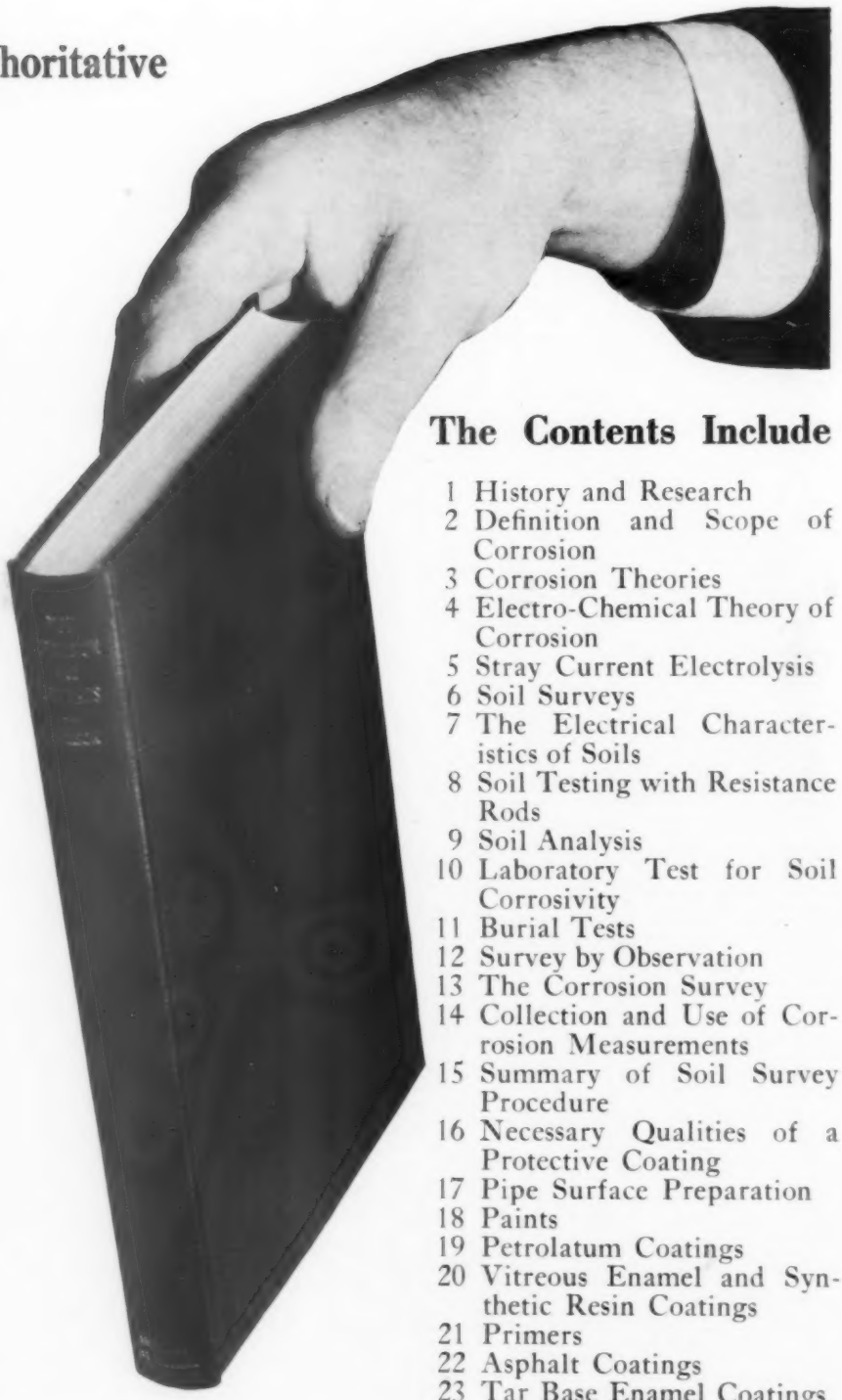
Outstanding among the features of the new Carrier gas-fired unit heaters are quick heat-up and thorough distribution with uniform retention of heat in working zone. These small, compact units are ceiling suspended, have aluminum painted louvres and are finished in soft tones of midnight blue. The heater shown is made in one, two and three fan units with capacities of 1,300, 2,600 and 3,900 cubic feet of warm air per minute. Especially suitable for year round air conditioning in stores, shops and other commercial buildings. Bulletin with specifications available through Carrier Corporation, Syracuse, N. Y.

A Complete and Authoritative Treatise on

PIPE CORROSION and COATINGS

by

Erick Larson



This book containing over 400 pages, will be off the press Oct. 15th. It is fully illustrated with many charts, diagrams and photos. See contents on this page.

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9 Soil Analysis
10 Laboratory Test for Soil Corrosivity
11 Burial Tests
12 Survey by Observation
13 The Corrosion Survey
14 Collection and Use of Corrosion Measurements
15 Summary of Soil Survey Procedure
16 Necessary Qualities of a Protective Coating
17 Pipe Surface Preparation
18 Paints
19 Petrolatum Coatings
20 Vitreous Enamel and Synthetic Resin Coatings
21 Primers
22 Asphalt Coatings
23 Tar Base Enamel Coatings
24 Practical Considerations in Application of Primers, Coatings &c.
25 Pipe Coating Fillers
26 Pipe Coating Shields
27 Cement Coatings
28 Cathodic Protection.

American Gas Journal

53 Park Place, New York

News of the Industry

Indiana Companies Elect New Officials

Departing from previous policy, individual presidents for the Public Service Company of Indiana and the Northern Indiana Power Company were elected September 22 by the respective boards of directors of the two companies.

Robert A. Gallagher of Indianapolis was elected to presidency of the Public Service Company of Indiana from the post of vice-president which he had held under John N. Shannahan, who had been president of the company from 1933 until his death in August.

Directors of the Northern Indiana Power Company elected L. B. Schiesz president of that company. As vice-president and general manager, Mr. Schiesz had been actively in charge of the company under Mr. Shannahan.

The announcement of the election of the new presidents pointed out that the selection of top executives from the operating personnel of the companies placed men in charge who had "intimate knowledge of their company's affairs and a close relationship with the operating personnel as well as the public in the territory served by each company."

The policy of drawing from the operating personnel also was followed in the election of vice-presidents. D. P. Pardee and G. J. Oglebay, both of Indianapolis, were elected vice-presidents of the Public Service Company of Indiana. Mr. Pardee had been comptroller of the company, and will continue to hold that position, and Mr. Oglebay had been assistant to the vice-president.

Phil H. Palmer of Kokomo, manager of the northern division of the company for a number of years, was elected vice-president of the Northern Indiana Power Company. Paul D. Birdsall of Indianapolis, secretary and treasurer of the Northern Indiana Power Company, was elected a director at the board meeting.

A.S.H.V.E. 1939 and 1940 Meetings

A recent news release announced the selection of Cleveland, Ohio, for the 1940 annual meeting of the American Society of Heating and Ventilating Engineers. The 1939 annual meeting of the society will be held as previously announced at the William Penn Hotel in Pittsburgh, Pa., January 23rd to 26th, 1939.

The reason for announcing the 1940 meeting so far in advance was to give notice to exhibitors planning displays at the International Heating and Ventilating Exposition, which will be held in Cleveland during the same week.

CONVENTION CALENDAR

October

10-14 *American Gas Association*, Annual Convention, Atlantic City.

10 *Association of Gas Appliance and Equipment Manufacturers*. All-day meeting at Hotel Claridge, Atlantic City, N. J.

17-21 *National Metal Congress and Exposition*, Detroit, Mich. To include exhibit sponsored by A.G.A. Industrial Gas Section.

24-28 *National Hotel Exposition*, Grand Central Palace, New York, N. Y. To include exhibit sponsored by A.G.A. Industrial Gas Section.

November

14-18 *American Petroleum Institute*, Stevens Hotel, Chicago, Ill.

Portland Gas & Coke Company Elects Barnett and Hall

Election of R. G. Barnett to the position of vice-president and general manager and advancement of E. L. Hall, operating manager, to vice-president and chief engineer, of Portland Gas & Coke Company, Portland, Oregon, was announced August 30 by Paul B. McKee, president.

A California native son, Mr. Barnett entered the gas business 17 years ago with the Pacific Gas & Electric Company.

R. G. BARNETT E. L. HALL

From that company he went to the Coast Counties Gas & Electric Company, which he served as manager. Most recently he was a director of the Emprezas Electricas Brasileiras in Brazil.

For the past 32 years, Mr. Hall has been with Portland Gas & Coke Company. He has had an important part in the development of the company's important by-product business and in the working out of new and improved methods of manufacturing gas.

Additional Exhibitors at New York 1939 World's Fair

From the national headquarters of Gas Exhibits, Inc. in New York, the names of additional manufacturers of gas plant and distribution equipment who have subscribed to Gas Exhibits, Inc. and the gas industry's participation in the New York 1939 World's Fair, have been announced.

It has been pointed out that this unprecedented cooperation on the part of all branches of the industry is making possible one of the outstanding exhibits at the 1939 Fair. Gas companies, manufacturers of gas appliances who will display their products in the main exhibition hall of the gas industry's building, and manufacturers of gas plant andd istribution equipment, have all joined forces in backing the gas industry's project at the 1939 Fair.

The new subscribing equipment manufacturers whose names were made public are: Cooper-Bessemer Corporation, Mt. Vernon, Ohio; Lambert Meter Company, Brooklyn, N. Y.; Mueller Company, Decatur, Ill.; Reynolds Gas Regulator Company, Anderson, Ind., and Sprague Meter Company, Bridgeport, Conn.

"Stories of American Industry" Now Available in Book Form

The radio program devoted to the gas industry which was broadcast February 5, 1938, by the United States Department of Commerce is now included in a book published by the Government Printing Office, and entitled, "Stories of American Industry." The book is a compilation of 32 radio programs, each of which gave the story of one great American industry. Harry R. Daniel was the editor of the script and narrator on the air. The program was given over the Columbia Network.

In his foreword Secretary Roper says: "The interest shown in our radio series by persons in all walks of life is to my mind proof that the people of this Nation are anxious to obtain a comprehensive understanding of the history, the accomplishments, the manifold problems, and the fine public service of our great industries.

"It is particularly gratifying that hundreds of colleges and schools in America are finding that these talks may be used to advantage in classroom studies. I believe that this wholesome public interest in all phases of industry indicates progress toward the solution of many of our problems."

Copies of the book may be obtained by forwarding ten cents to the Superintendent of Documents, Washington, D. C.

Leading officials in the gas and gas appliance industries who, with more than two score representatives of these allied industries were guests of Gas Exhibits, Inc., at luncheon in the Terrace Club at the New York World's Fair 1939. The representatives later inspected the $750,000 Gas Exhibit Building now rapidly nearing completion in the Community Interests Zone of the Fair, and made an extended tour of the Exposition grounds. In the photograph, left to right: C. N. Lauer, Vice-President, American Gas Association; Hugh Cuthrell, President, Gas Exhibits, Inc.; Grover A. Whalen, President of the Fair Corporation; N. C. McGowen, President, American Gas Association; M. N. Davis, President, Association of Gas Appliance and Equipment Manufacturers.

Industrial Business of Citizens Gas & Coke Utility

Since 1929, our industrial business has made great strides, the send-out to customers having increased 80 per cent.

The gas consumption of industrial users accounts for 25 per cent of the Utility's total gas sales. They are the foundries, packing houses, railroad shops, hosiery and garment mills, and printing plants where gas is used for thousands of different heating processes from boiling soup to melting lead. The gas consumption of these customers is measured not in thousands of cubic feet, as in the case of the average domestic user, but often in millions of cubic feet monthly. One of the largest local industries uses at peak operation, as much as 16,000,000 cubic feet per month—equal to the combined consumption of approximately 6,600 average homes.

The men who sell industrial gas are primarily consulting engineers. They obtain invaluable help from the manufacturers of gas equipment, but their job goes a great deal further than merely specifying and selling appliances. Their success in this field hinges largely on their ability to analyze plant engineering problems and to provide heating equipment that will enable their customers to manufacture a better and cheaper product. Often they may work for months on a single job—patiently experimenting with burner designs, mixtures of gas and air, speed of combustion or even rebuilding furnaces, before they can prove their case and sign up the customer. Facts and results are the important consideration, not the initial cost of equipment and fuel.

Of course, our product has distinct advantages over other fuels in certain operations, such as carburizing and bright annealing where chemical and metallurgical reaction of the gas with the product are an integral part of the process. The gas-fired radiant tube because of its flexibility in meeting heavy heating-up demands and ability to maintain the temperature essential to uniform heating, has widely replaced the electric element.

Gas has proved a great boon to the steel industry, particularly, where it is used for long annealing cycles, malleabilizing, deoxidizing and normalizing steel sheets and strips, hardening and tempering steel parts and for many other processes requiring treatment in controlled atmospheres.

Selling industrial gas is not an easy job. It demands broad technical knowledge, the ability to inspire the confidence of plant engineers, patient application and, above all, a genuine spirit of service to the customer. While Gas is inherently superior to other fuels it must be sold on the basis of improved product, increased production and lower overall costs rather than bare cost of fuel. But the satisfaction and good will engendered by each successful installation are powerful factors in selling additional industrial load and explain why industrial gas salesmen are usually so keen about their jobs. —N. R. Gorsuch in *The Gas Flame.*

National Safety Council Awards

Winners of several sections in the National Safety Council's annual industrial contests have been announced.

In the three contests which closed on June 30, 1938, more companies were enrolled than ever before, and favorable accident trends were observed in all three sections.

Bronze trophies are being presented to representatives of the winning companies at the Silver Jubilee Congress in Chicago, October 10-14.

In the Gas Divisions trophies were won by the following companies:—Columbia Gas & Electric Co., Columbus, Ohio Group; The Dallas Gas Co., Dallas, Tex.; The Asheville Gas Co., Asheville, N. C. Honorable mention certificates go to Hope Natural Gas Company, Laclede Gas Light Company and Columbia Gas & Electric Corporation, Binghamton Group, Binghamton, N. Y.

New Coke Oven Plant

Construction has been started on the new by-product coke oven plant for the Midwest Smokeless Fuel Corporation. This plant will consist of twenty Curran-Knowles coke ovens and is located near East St. Louis, Illinois.

The Curran-Knowles ovens being built at Owen Sound, Ontario, will go into operation about October 15th.

INDUSTRIAL GAS BOILERS

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¾ to 45 H.P.

P. M. LATTNER MFG. COMPANY
CEDAR RAPIDS, IOWA

Food For Thought

1. 20,000 miles of mains surveyed.
2. 14,000 new gas leaks located.
3. 40,000 valuable reports made on trees and shrubs.
4. 150 companies using the service.
5. Enough savings in unaccounted for gas to pay the bill.
6. A trial will convince you.

May we hear from you?

New England Forestry Service Inc.
75 Federal St., Boston, Mass.

A. G. A. E. M. Directors Discuss Sales Campaigns' Progress

Leading manufacturers of the gas industry met in New York September 7th at the special meeting of the board of directors of the Association of Gas Appliance and Equipment Manufacturers. Merrill N. Davis, executive vice-president of the S. R. Dresser Manufacturing Co., Bradford, Pa., and president of the Association, presided.

Applications for membership in the Association by thirty-one companies in various parts of the United States were approved by the board members.

Because of the New York 1939 World's Fair, it was voted that next year's annual convention of the Association take place in New York. The time was temporarily set for the latter part of May.

Reports were presented on the numerous sales promotion projects which the Association is now conducting, such as the "Prize Parade," in behalf of automatic gas water heaters, which is being participated in by thousands of plumbers and retail water heater dealers; the gas refrigeration selling campaign which enlisted the support of gas companies and their salesmen throughout the country; and the CP Gas Range program now being projected nationally by the Association.

W. E. Derwent, chairman of the Association's domestic gas range division and vice-president of the George D. Roper Corp., of Rockford, Ill., reporting on the new CP Range Program said: "This program is gaining the most rapid momentum ever experienced in the launching of a new product to American homemakers. In a little over four weeks, requests for sales promotion, advertising and merchandising material have been received from nearly 300 gas companies to be used in launching CP Gas Range campaigns.

"Already nineteen manufacturers have been licensed to produce and sell CP Ranges, and more than 150 specific range models which have passed the twenty-two rigid specification requirements are being offered for sale. They are being supported by manufacturers' individualized promotional campaigns which tie in closely with the Association of Gas Appliance and Equipment Manufacturers and the American Gas Association's national advertising campaign. Manufacturers are also carrying the CP story in their own national consumer and trade advertising campaigns."

The third annual meeting of the Association takes place in Atlantic City at the Hotel Claridge on Monday, October 10. The principal event at the gathering of the gas industry's manufacturers is the election of the new officers and members of its board of directors for the fiscal year 1938-39. In addition to the main general session there are also meetings of the Association's various divisions to include elections of officers for their respective groups.

JOHN E. ZIMMERMANN

John E. Zimmermann, who resigned as chairman of the board of Philadelphia Electric Co. was succeeded by William H. Taylor, president. Horace P. Liversidge, vice-president and general manager, becomes president, succeeding Mr. Taylor. Mr. Zimmermann will continue as chairman of the executive committee.

Friez Acquires Nicostat

Announcement is made of the purchase by Julien P. Friez & Sons Division of Bendix Aviation Corporation, Baltimore, Maryland, of the business of Nicostat Products, Inc., of Buffalo, New York.

The Nicostat Company has developed a unique range of Magnetic Gas Valves, providing either slow or quick-acting performance, and based upon the patented principle of the "floating disc". An attractive and moderately-priced Safety Pilot assembly is also included in the range.

The entire physical activity is being moved to Baltimore, and the transfer of personnel to Baltimore includes Mr. Nico Borresen, the Engineer, and Mr. G. F. Knowles, the General Manager. Mr. Konwles will take charge of the greatly expanded activity of the "Gas Section" of the Friez Division's Control Instruments Department. Effective immediately, all communications concerning the combined Friez and Nicostat activities should be addressed to Julien P. Friez & Sons Division of Bendix Aviation Corporation, Baltimore, Maryland.

HAYS *Threadless* GAS STOPS

Hays now provides a threadless method of hooking-up service pipe. Elimination of threaded pipe ends adds 40% to the strength of pipe in the joint. An outstanding feature is the ease of assembly under any conditions. The pipe is in constant seal but floats in the joint to permit flexing due to vibration or ground pressure. Large pack surface of gasket assures tight connection even with corroded or deflected pipe. Write for data.

HAYS MFG. CO., ERIE, PA.

Pioneers of the Gas Industry

John Malam

"BLUE-BILLY", the foul milk of lime, was the nemesis of the wet-lime process of purification; a New Yorker, John Malam, therefore proceeded to invent the dry lime method in 1851. This was an advance but purification was still in the cradle stage. Many more years of patient research were needed to develop today's standard of purification material, GPM Iron Hydroxide, product of the *Gas Purifying Materials Company, L. I. City, N. Y. & Providence, R. I.*

Domestic Gas Range Committee Produces CP Salesmaker

At the last meeting of the Domestic Gas Range Committee of the American Gas Association, details and plans for a CP Salesmaker were discussed. This committee, under the chairmanship of F. M. Houston, is composed of six members of A.G.A. and six members of the A.G. A.E.M., causing both the utility and manufacturers viewpoint to be incorporated in the publication of this sales prospectus.

Since the time of the above meeting, many additional suggestions and ideas for this valuable sales tool have been received. The best of all the ideas are now being consolidated by the Association of Gas Appliance and Equipment Manufacturers who are underwriting the cost of producing this sales item. The work on the finished copy has been carried forward by the Sales Management Committee of that association under the chairmanship of A. P. Tappan.

The CP Salesmaker will carry a complete, visual, non-technical presentation of the 22 points of superiority of CP gas ranges. The last 8 pages of the book are devoted entirely to the justification for purchase of a CP range by conclusive proof that CP ranges practically pay for themselves with their latest time saving—fuel saving—food saving features. Four colors are used to produce those pages showing delicious food pictures.

This item was publicized by a description in the CP Sales Plan Book recently distributed to utilities. From that source alone so many samples have been ordered by utilities throughout the United States that a sale of over 5000 copies of this salesmaker is indicated. The sale price, as previously publicized, will be on a cost basis of only $1.25 per copy.

Due to the general and institutional composition, the book is easily adapted to the promotion of the sale of any make of gas range. A pocket is provided in the back for the addition of the specific makes and models being promoted by a retail outlet.

The Association of Gas Appliance and Equipment Manufacturers report that all orders now being received on this item will be filled by October first, at which time all shipments of this new sales item will go forward.

J. W. West, Jr., Director of A.G.A. Home Appliance Planning Bureau

Following the resignation of John F. Quinlan as Director of the American Gas Association's Home Appliance Planning Bureau on October 1st, the activities of this Bureau have been assigned to the Commercial Section. J. W. West, Jr. has been appointed Director of the Bureau and will continue as Secretary of the Commercial Section, with F. W. Williams as Assistant to Director of the Home Appliance Planning Bureau.

The Bureau's Nationwide Competition for the construction of homes utilizing gas for cooking, refrigeration, water heating and house heating, by builders and architects during the two-year period ending July 1, 1939 shows great progress. More than 1100 builders and architects have registered in this Competition.

New Koppers Phenolate Plants

Contracts for two Koppers phenolate plants for the purification of refinery still gas have been awarded by the Sun Oil Company to Koppers Company's Engineering and Construction Division. The amount of money involved was not announced.

A plant employing a two-stage system and with a capacity of 10,000,000 cubic feet of gas a day is to be erected at the oil company's Toledo, O., refinery. A single-stage plant, to be provided for the Marcus Hook, Pa., refinery, will have a daily capacity of 12,000,000 cubic feet of gas.

Other Koppers phenolate plants are in operation on refinery gas at the El Segundo refinery of the Standard Oil Company of California and at the Philadelphia refinery of the Atlantic Refining Company.

This process, developed by Koppers Company, uses a sodium phenolate solution for low cost recovery of hydrogen sulfide from refinery still gas. This may be converted into sulfuric acid for plant use or for the market.

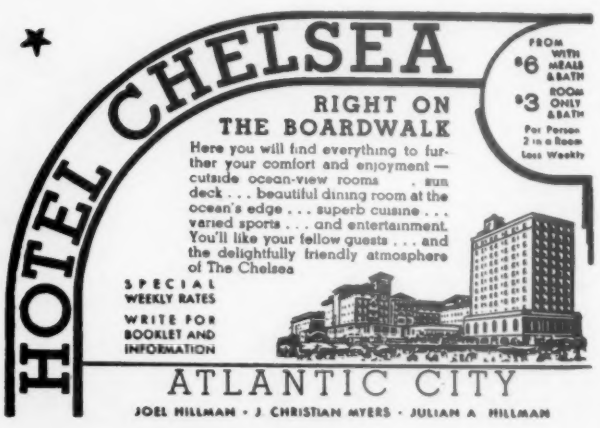
American Lava Corp. Expands

The American Lava Corporation of Chattanooga, Tennessee, has acquired all equipment and good will of the American Ceramics & Specialties Corporation of Jackson, Michigan, and will remove the equipment to its Laboratory and Works at Chattanooga.

Carl R. Hower, Vice-President and Manager, and O. D. Riseden, Production Engineer, will be retained in Sales and Engineering capacities with the American Lava Corporation.

American Bosch Elects Directors

The following new members were elected to the directorate of the United American Bosch Corporation at a meeting held in New York in September: Wm. Batt, President of SKF Industries; J. P. McGuire, President of J. P. McGuire & Co.; Frank Hamilton of Monnet, Murnane & Co. The other members of the board are George Murnane, Chairman and D. P. Hess, President of the Company.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Per Person 2 in a Room Less Weekly
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Book Review

Thermo dynamics, Fluid Flow and Heat Transmission, by Huber O. Croft. Published by McGraw-Hill Book Company, Inc., 1938. 323 pages with numerous charts and diagrams. Price $3.50.

This is a book for the advanced student of these subjects. It presupposes an elementary knowledge of thermo dynamics and hydraulics, though it includes a brief review of these subjects.

The purpose of the book is to review advanced thermo dynamics, introduce dimensional-analysis, fluid-flow, and heat-transmission problems, and to combine this material into one continuing study, as are actual engineering problems, rather than to separate the material into small individual packets of extremely specialized knowledge, each with a specialized-course title and requiring a separate text.

A serious attempt has been made to express the constants of all important equations in units and dimensions determined from the logic of dimensional analysis, without the introduction of arbitrary multipliers. For example, the units of viscosity used throughout are *force* X *time per unit area* as defined by Eq (7.5), in which the unit of pressure is *force per unit area* (as pressures are actually measured in engineering work), and without the unnecessary introduction of an acceleration (g) to confuse the student. Likewise, a clear distinction is made between density and specific weight. Density is defined as the *mass per unit volume* and specific weight is defined as the *weight (force) per unit volume.*

The subjects covered include the following: Definitions and Units; Dimensional Analysis and the Principle of Similitude; Thermodynamics of Perfect Gases; General Differential Equations Applying to Thermodynamics; The Thermodynamics of Vapors and Equations of State; Analysis Based upon the Second Law of Thermodynamics; The Flow of Fluids; Measurement of Fluid Flow; Heat Transmission; Engineering Characteristics of Solid Particles in Fluid Streams; The Compression of Fluids.

Obituary

DR. CHARLES CARPENTER

Dr. Charles Carpenter, until last year President of the South Metropolitan Gas Company of London, died on September 7, 1938, at the age of 80. With his passing, the gas industry, not only in England but throughout the world, lost a great engineer and a great administrator.

Born in 1858, he entered the service of the South Metropolitan Gas Company at the age of sixteen and quickly rose to the position of chief engineer. He became a member of the Institution of Gas Engineers in 1890, and was elected President five years later.

Dr. Carpenter was not only a great gas engineer but a great administrator. In December, 1908, he was elected to the Board of the South Metropolitan Gas Company and in May, 1909, was elevated from chief engineer to President, a position which he held for the long space of 28 years until his retirement last year.

CHARLES CARPENTER, C.B.E., D.Sc.
From the portrait painted in 1925 by Gerald L. Brockhurst, A.R.A.

He was a firm believer in the principles of co-partnership initiated by his famous predecessor, Sir George Livesey, and developed the system with such success in the companies with which he was associated that his example was followed by many others, and today more than half the employees in the gas industry are co-partners. In 1914 he received from the French Société pour l'Etude de la Participation aux Bénéfices the Prix Goffinon gold medal in recognition of his efforts on behalf of co-partnership in industry. His fame was by no means confined to the gas industry. In 1915 and again in 1916 he was President of the Society of Chemical Industry. As a member of the chemical warfare committee and munitions inventions panel of the Ministry of Munitions, he was closely associated with Lord Moulton in the production of high explosives. For this and many other signal services in similar connections he was honored and decorated.

Dr. Carpenter was also chairman of the South Suburban Gas Company and the Commercial Gas Company, both of which worked in close touch with the South Metropolitan Gas Company.

Dr. Carpenter's contributions to scientific and technical knowledge are well known and have received fitting recognition. Perhaps the portion of his technical work in which he took the greatest interest was in the measurement of gas. To him was mainly due the change in the unit of measurement from the cubic foot to the therm and he was the inventor of the therm recording gas meter as far back as 1923.

He was an enthusiast on the question of gas lighting and throughout his life regarded the retention of the lighting load as of the utmost importance to the industry. It was this conviction that led him in 1903 to discuss three papers relating to high pressure lighting, one of the few times that he spoke at such meetings.

FRANCIS GREER GOODMAN

Francis G. Goodman, President of the Safety Gas Main Stopper Co., 523 Atlantic Avenue, Brooklyn, N. Y., died on Sunday, September 4, 1938, at the age of thirty-six years. He was the youngest son of Patrick Goodman, founder of the Company, who made the first Goodman Stopper in 1897. Mr. Goodman was well known to the Distribution Departments of gas companies both in this country and abroad. He was born in New York City and received his education there and in the University of Toronto. Mr. Goodman was an accomplished musician.

Extensive Arc Welding Exhibit Planned by Lincoln

Noteworthy advancements in arc welding equipment and procedure will be displayed and demonstrated by The Lincoln Electric Company, Cleveland, Ohio, at the National Metal Exposition to be held at Detroit, Michigan, October 17-21.

J. H. Wheatley Promoted

The appointment of James Howard Wheatley to the position of Superintendent, General Shops, replacing the late E. J. Turley who died suddenly last August, is announced by C. S. Bagg, vice-president and general manager of Montreal Light, Heat & Power Consolidated. The appointment became effective October 1.

Mr. Wheatley, formerly associated with the company's industrial department in the capacity of industrial gas engineer, graduated from McGill University in 1912. After graduation he joined the Northern Electric Company as assistant cable engineer. In 1926 he was appointed superintendent of Domestic Gas Appliances, Limited. He is a member of the Engineering Institute of Canada.

(Continued from page 25)
the railroad company was not obliged to serve territory so distant from its existing lines.[21] Consequently, this provision either may be slightly used or, if it is frequently used, it will bring about litigation.

When a pipe-line company's natural-gas supply is depleted sufficiently to make service "unwarranted," the Commission will permit abandonment of all or possibly a portion of its system. Further, abandonments will be allowed when "the present or future public convenience or necessity permit such abandonment." In the future as in the past it is likely that abandonments of natural-gas service will be attributable in most instances to a waning gas supply.

A controversial portion of this section (7) concerns the circumstances under which a certificate of convenience and necessity will be granted. A certificate need not be obtained except when natural gas or mixed artificial-natural gas is being served in the market to which the extension will be made. There is, consequently, no safeguard against construction of a natural-gas line to a market already served with manufactured gas. Though displacement of manufactured with natural gas has been customarily done without duplication of facilities, there is no assurance that trouble will not occur.

A certificate must be secured, however, if a line is to be constructed to or acquired in a "market" that is being served with natural or mixed gas. The rough guide for these grants will be the "present and future public convenience and necessity" for them. Unless the following statement is designed to cover cases of two existing pipe lines in the same market or to serve as an elaboration of the preceding statements, it may lead to trouble:

"A natural-gas company already serving a market may enlarge or extend its facilities for the purpose of supplying increased market demands in the territory in which it operates."

Unnecessary duplication of facilities may be avoided by these requirements on certificates of convenience and necessity. In recent years there have been several fights between established natural-gas systems and newly organized pipe-line companies. Whatever may have been one's position in the controversy, for example, between the Panhandle-Eastern Pipe Line Company and the Columbia Gas & Electric System, claims that the former was invading the "territory" of the latter could have been quickly settled if a certificate had been required of the Panhandle Company before construction of its line was begun. Because public utility regulation is arranged in part as a substitute for competition, prevention of uncontrolled duplication of gas pipe lines is justified.

The Cities Alliance crowd opposed the above requirement for certificates of convenience and necessity.[22] (They want lower gas rates.) Several of their jumbled ten reasons for eliminating this requirement on certificates avowed the superior ability of state commissions and cities to judge whether such certificates should be granted, and some of the other reasons are summarized probably in the statement that these restrictions "are not required to defend entrenched monopolies against competitive raids."[23] Perhaps, therefore, this qualification of preceding provisions is attributable to this group:

"In passing on applications for certificates of convenience and necessity, the Commission shall give due consideration to the applicant's ability to render and maintain adequate service at rates lower than those prevailing in the territory to be served. . . ." If the Commission gives much attention to this part of the section, price wars and sheer duplication of pipe lines may result.

State commissioners would oppose a law endangering some of their existing powers, and, for this reason, some of them objected to the aforementioned Capper Bill. There are, therefore, many parts of the Act which aim to bring cooperation between state commissions and the Power Commission, or to prevent encroachment upon state regulation of natural-gas companies. Because the law contains some powers over gas reserves and production matters as well as transportation and sale of natural gas moved interstate, there yet may be some conflicts about state, local, or federal jurisdiction. It probably will be decided that interstate commerce ends, as it was concluded in the East Ohio Gas case,[24] when the gas pressure is low enough to permit gas to be used in customer burners. But this dividing line is subject to different interpretations.

A state, city, or state commission may file a complaint against and secure an investigation of a proposed rate schedule or any other matter that is believed to be in contravention of the Act. Prescription of an accounting system and records plus rules and rates for depreciation and amortization of property will not relieve a company of different requirements by states on these aspects of regulation, although conferences between state commissions and the FPC are likely on these features. Not only will the FPC confer with state commissions on all the phases of its power, but it may hold joint hearings with state commissions. State commissions may obtain information and reports from the Power Commission. A state commission may request the Commission, when the affairs of the latter will not be prejudiced, to determine the cost of production and transportation of natural gas in cases where the Power Commission has no authority over rates. Moreover, and this seems to be even more important, the Commission will furnish rate, valuation, and other experts to state commissions when this is not prejudicial to its own interests and when the FPC is reimbursed for these services.

The Commission may refer any matter to a Joint Board that it selects from the state or states affected by the problem under consideration. A Board would be chosen from persons nominated by the state commission or by the Governor if there is no commission, but the FPC may reject a nominee and invite another nomination. All involved states are entitled to the same number of representatives. Although such boards would have the same powers and duties as the Commission, the latter may, "when in its discretion sufficient reason exists therefor, revoke any reference to such a board." These Joint Boards reveal the limits of the Act in dispelling at least some fear of jurisdictional disputes.

Wherever two or more states request Congressional consideration of a compact concerning production, transportation, or sale of natural gas, the FPC must gather information for Congress. At such times the Commission will be expected to make recommendations for additional legislation that will aid operation of the compact and conservation of natural gas and "orderly, equitable, and economical production, transportation, and distribution of natural gas." Further, when a compact is in effect, the Commission shall assemble information on its operation.

These provisions on compacts are the only ones that deal directly with conservation of natural gas. Probably no one would contend that state compacts are a reliable means of preventing gas wastage. Compacts must be approved by Congress. The ever-changing business of gas production well reveals the difficulty of getting and retaining such a compact. If somehow states were to make an agreement on gas conservation, even though commonness of such agree-

[21] 75th Cong., 1st Sess., H.R. 5711, S. 1919.
[22] 75th Cong., 1st Sess., *Hearing before the Committee on Interstate and Foreign Commerce . . . on H.R. 4008*, 1937, pp. 62-6.
[24] 283 U.S. 465 (1931).

ments seems impossible, it would be difficult to maintain it. The same gas production conditions are not continually retained in any state; and development of new fields and waning of the old ones would disturb a compact.

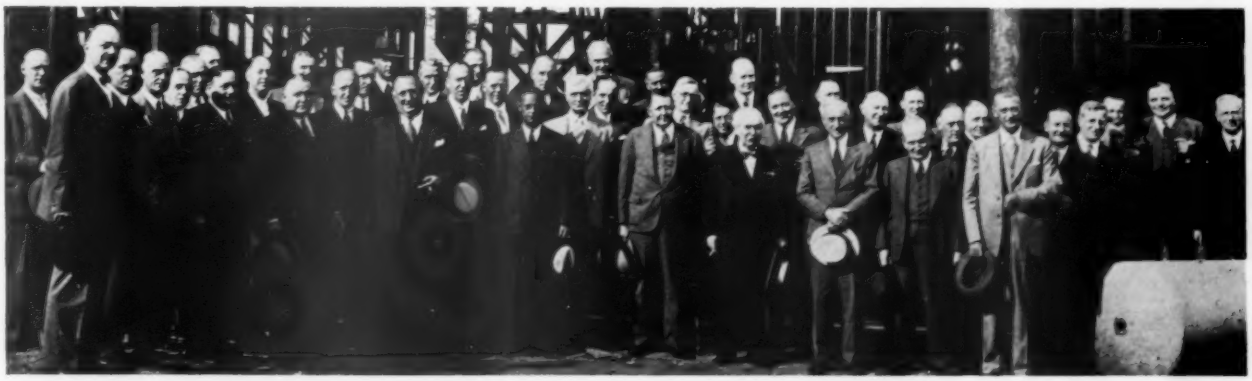
Consequently, there are no notable gas-conservation features of the law,[25] although a representative of the Federal Trade Commission asserted that compacts were "about the only way it could be done."[26] Yet gas wastage such as occurred under the Texas "Sour Gas Law" may warrant federal attention. If some blame for waste of the Texas Panhandle gas is attributable to interstate pipe-line companies, federal regulation might have been applied to some of these gas-production problems. But in reality there may be no way short of unit-production agreements—they too are not easily secured—to ameliorate the differences of independent and pipe-line company producers of gas.

There are miscellaneous sections of the Act that will not be given particular attention re: permission of the Commission before gas may be exported or imported; statements about the manner of investigations, depositions, and attendance of witnesses; rules on hearings; general administrative powers of the FPC; penalties and means of enforcement of the Act.

It has been known for several decades that regulation of all interstate transmission of natural gas awaited establishment of federal controls. Growth of the business of interstate transportation of natural gas during the last ten years unquestionably hastened enactment of this regulation. Some of the sections of the law providing these controls are mill-run matters in utility regulation—statements, for example, about an accounting system and records, non-discriminatory rates, and valuations. Although the powers given the Federal Power Commission over construction and abandonment of gas pipe lines are not peculiar to this regulatory Act, there are likely to be difficulties in determination of the limits of them. Like the Natural Gas Act much of public utility regulation involves attempts at definitions of generalities, as, say, judgment of what is an unjustly discriminatory rate. The novel sections of the Act are those which are designed to facilitate state and federal cooperation in regulation of interstate gas pipe lines. But the compact provisions do not appear to be an effective means of obtaining conservation of natural gas.

[25] The bills sponsored by the Cities Alliance (75th Cong., 1st Sess., H.R. 5711, S. 1919) contained provisions about non-discriminatory purchasing of gas.

[26] 74th Cong., 2d Sess., *Hearing before a Subcommittee of the Committee on Interstate and Foreign Commerce on H.R. 11662*, Testimony of Col. Chantland, 1936, pp. 58-9, 66-7.



Board members of the American Gas Association and the Association of Gas Appliance and Equipment Manufacturers visiting the Gas Exhibits Building at the New York World's Fair 1939 in which are to be displayed all the phases of their industries in new and striking fashion. The Gas Exhibits Building is to cost $750,000 and is located on a large plot in the Fair's Community Interests Zone on a wide avenue radiating from the Theme Plaza, focal point in the Exposition's Main Exhibit Area. The building is made distinctive by four 90-foot pylons, suggestive of the grid points of a gas range burner, towering over the structure. The pylons enclose the "Court of Flame" in which a huge gas jet is to burn as a torch.

(Continued from page 36)

but not to the primed section of the cut back ends. Floor mops are frequently used for whitewashing, as they provide a greater capacity than whitewash brushes and therefore save time.

When enamel has been applied by the rolling method, the pipe is left on the rolls for inspection and application of whitewash. When the pipe has been enameled over a ditch, the whitewash is applied after inspection and touch-up to the top two-thirds only, or to that portion convenient to the painter walking along the ditch. This two-thirds should be the only portion which will be directly in the sun's rays.

Whitewash is applied to coupler compounds when the maximum expected temperature will be 70° to 75°F.

Protection of Workmen

The fumes from enamels are irritating to the eyes, nose, throat and skin. This is particularly true when the workers exposed to the fumes perspire freely. The kettle operator is the most severely exposed but the application crew is frequently affected. The first precaution is to maintain proper enamel temperatures so that the fumes will be a minimum. A second is to have the men coat their faces and the backs of their hands with a non-irritating grease or an alkaline powder. Parts of the skin covered with clothing are not affected.

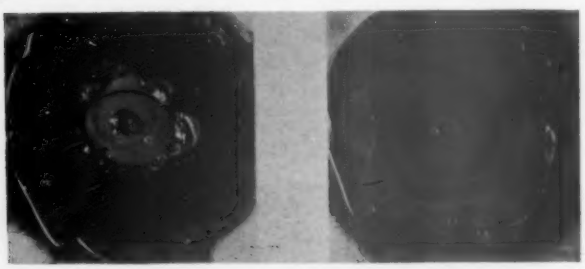
Tests of Coatings

Impact Test

Prepared specimens are allowed to reach room temperature, and then are completely immersed in a water bath maintained at a uniform temperature of 77° F., plus or minus 1° F., for a period of at least one hour before testing. After removing from the bath each specimen should be dried with a soft clean cloth and immediately subjected to the impact.

The specimen should rest uniformly on a solid block. A polished steel ball weighing 1.65 pounds is suspended above the center of the specimen.

A trial and error method is used to determine the minimum height which the ball must be dropped to produce failure of the coating. On paint coatings failure is determined by applying a small voltage from a battery having a milliammeter and resistance in series with the pipe. A piece of wet flannel is pressed against the point of impact. Any flow of current indicates failure. Visual inspection is sufficient to determine the nature and extent of damage to heavier coatings.



Good enamel. Poor Enamel.

Results of impact test.

Some coatings will produce a damage to the coating sufficient to interfere with its corrosive resisting qualities when the ball is dropped 2 to 3 feet while repeated dropping from a height of 8 feet has failed to affect others.

Temperature, hardness, diameter of both pipe and ball and roughness of the coating will affect the results.

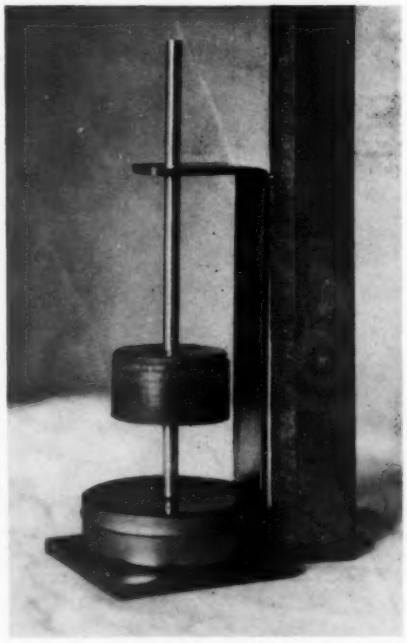
The shattered enamel should be carefully removed with a sharp pointed knife to ascertain the area of metal exposed. The area of destroyed bond is sometimes measured with a planimeter.

Federal specification 52 B 10 superseded in part by 52 P 17 cover the shatter test in detail.

The test specimen is sometimes reversed so that the enamel is on the opposite side from that subject to the impact. The specimen rests with its center coincident with the center of a 3½" diameter hole in the support. The ball is made to strike at the center. After an impact, the ball dropping eight feet, the enamel is examined for shattering or loosening.

Pressure Deformation Test[6]

"The apparatus devised to study the effect of direct pressure is illustrated herewith. Briefly, the operation comprises filling a shallow dish of standard diameter and depth with the melted material to be tested.



Pressure Deformation Tester

The specimen after cooling and adjusting to the desired temperature is placed on the platform serving as a base for the support by which a weighted monel metal rod with squared-off ends is brought to bear vertically and centrally on the surface of the specimen. The whole apparatus is immersed in a water bath which is controlled by thermostat at any given temperature.

"The depth to which the rod penetrates into the specimen by reason of the pressure of the weight applied, is measured directly using the top of support as a reference surface. Under a given set of conditions the further the rod penetrates into the specimen the less is the resistance to direct pressure offered by that particular material.

"The magnitude of the pressure used in the test was somewhat arbitrarily fixed at 25 lbs. per square inch. This value was considered to be at least within the range of the value calculated for uniform earth pressure of approximately 1¾ pounds per square inch for a two-foot depth and the undoubted much higher pres-

[6] "Laboratory Methods for Measuring Certain Physical Characteristics of Bituminous Pipe Line Enamels," by F. W. Yeager, The Barrett Company.

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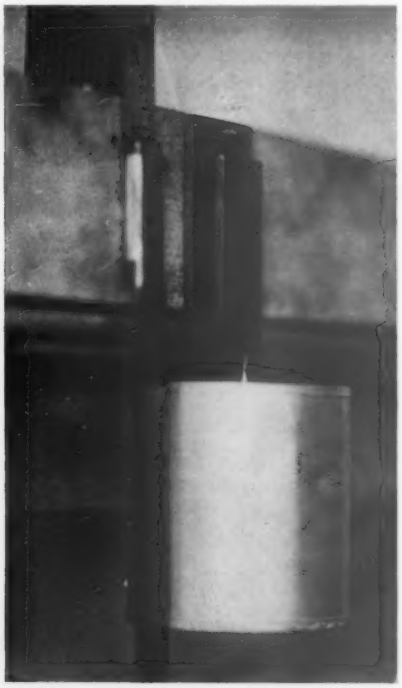
sures where the sharp rocks are in contact with the coating or where the pipe bears unevenly on the bottom of the trench.



Shear Deformation Tester.

"A rod of ¼ inch circular cross section gave a reasonably large bearing surface without requiring an excessively large weight.

"As representative of the higher range of under ground temperatures a test temperature of 77° F. (25° C.) was selected.

"A time period of 96 hours for comparative purposes has been found satisfactory. For higher temperatures representing lowering in conditions in warm weather, higher temperatures and shorter time periods have been studied.

"The test was developed along these lines in preference to using the needle type of penetrometer because its performance corresponded more nearly to service conditions in that moderately high pressures were employed over extended periods of time.

"The use of a bearing surface of appreciable area represented by the face of the rod is considered to be more suitable than the relatively minute area of the penetrometer needle, particularly when reinforcements of a variety of types and sizes would be represented in the compositions subjected to test."

Shear Deformation Test[6]

"The shear deformation test was set up to measure quantitatively the deformation produced in a layer of enamel held between two plates when a fixed force was applied over long periods of time in a manner to cause the plates to have a parallel motion with respect to each other. Some problems of laboratory technique involved in putting the idea into practical form were encountered but we believe have been eliminated in the set up to be described.

"Plate II shows the test piece assembled. Melted enamel to be tested is poured into a heated mold so that when cooled it can be removed in the form of a specimen comprising a layer 3/16 inch thick cementing together two parallel brass plates over an area of two square inches. These plates have oppositely projecting ends. The test specimen is held in a vertical position by means of the projecting end of one plate and a weight is suspended from the projecting end of the other plate so that the layer of enamel is subjected to a shearing strain created by the downward pull of the weight."

New Law of Contracts Involving Gas

(Continued from page 68)

installing equipment the company implies a contract to safeguard consumers from injuries caused by negligence of the employes of the company.

For example, in Bailey v. Atlanta Gas Light Co., 197 S. E. 911, reported August 25, 1938, it was shown that on the last day of April a man and his family moved into a house located in Atlanta, Georgia. The gas company had placed its gas-meter on the back porch of the house under a large window between the porch and a bedroom. The consumer sued the gas company claiming that gas had leaked from the meter and passed into the bedroom, whereby his lungs were congested, his sight impaired, his nose, throat, and bronchial tubes affected, and he could hardly breathe, and, though he had been able to work day and night, his ability to work was greatly decreased and his earning capacity reduced.

It was proved that the hole in the gas-meter was not long, and only large enough to stick a pin in, and was hard to locate because the ordinary pressure of the gas was not strong enough to make a bubble when soapy water was applied. Therefore, the higher court refused to hold the company liable, and quoted:

"In a suit for damages alleged to have been sustained as a result of the defendant's (gas company's) negligence, where the inference of negligence, if existing, depends entirely upon circumstantial evidence, and where there is direct testimony consistent therewith which shows that the defendant was without negligence and which is not subject to discredit upon any ground, a verdict in the plaintiff's (consumer's) favor is unauthorized."

Compensating Salesmen

(Continued from page 69)

follow-up prospect in an outlying section merely because the call is so far away that he doesn't care to pay for car mileage. This has been reported many times in our field survey work by sales managers for gas companies and other concerns. Often follow-up calls are scattered from one end of a territory to another, salesmen working the calls closest together and passing up the widely spaced calls. Often, this results in loss of business because the outlying prospects may be better potential purchasers than those nearer home. Many companies have adopted some form of car compensation just to eliminate this costly lapse; and those that have done so, report betterment in the matter of distant follow-up calls and increased sales.

Taking the figures from our survey work sheets in all fields, we find that only 20 per cent of the companies supply cars to salesmen. In some fields, we found that companies assist their salesmen in buying new cars by advancing them the down payment with the proviso that they pay it back in installments as they pay the finance company.

The results of our field survey are merely offered to show what others have done with this problem.

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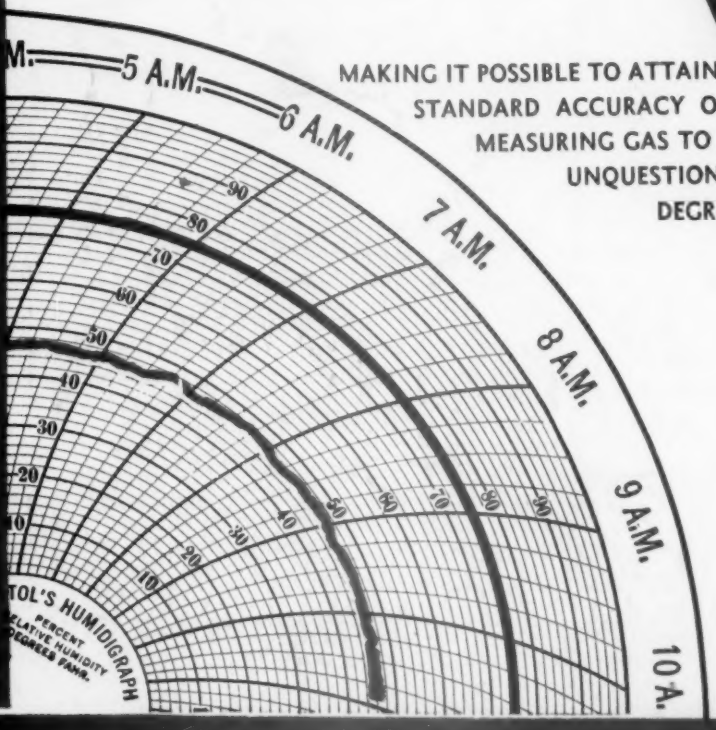

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